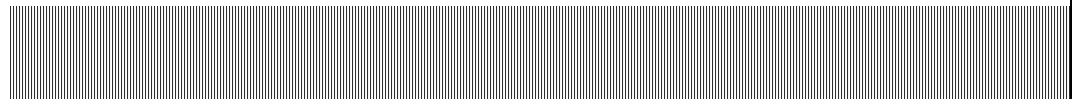
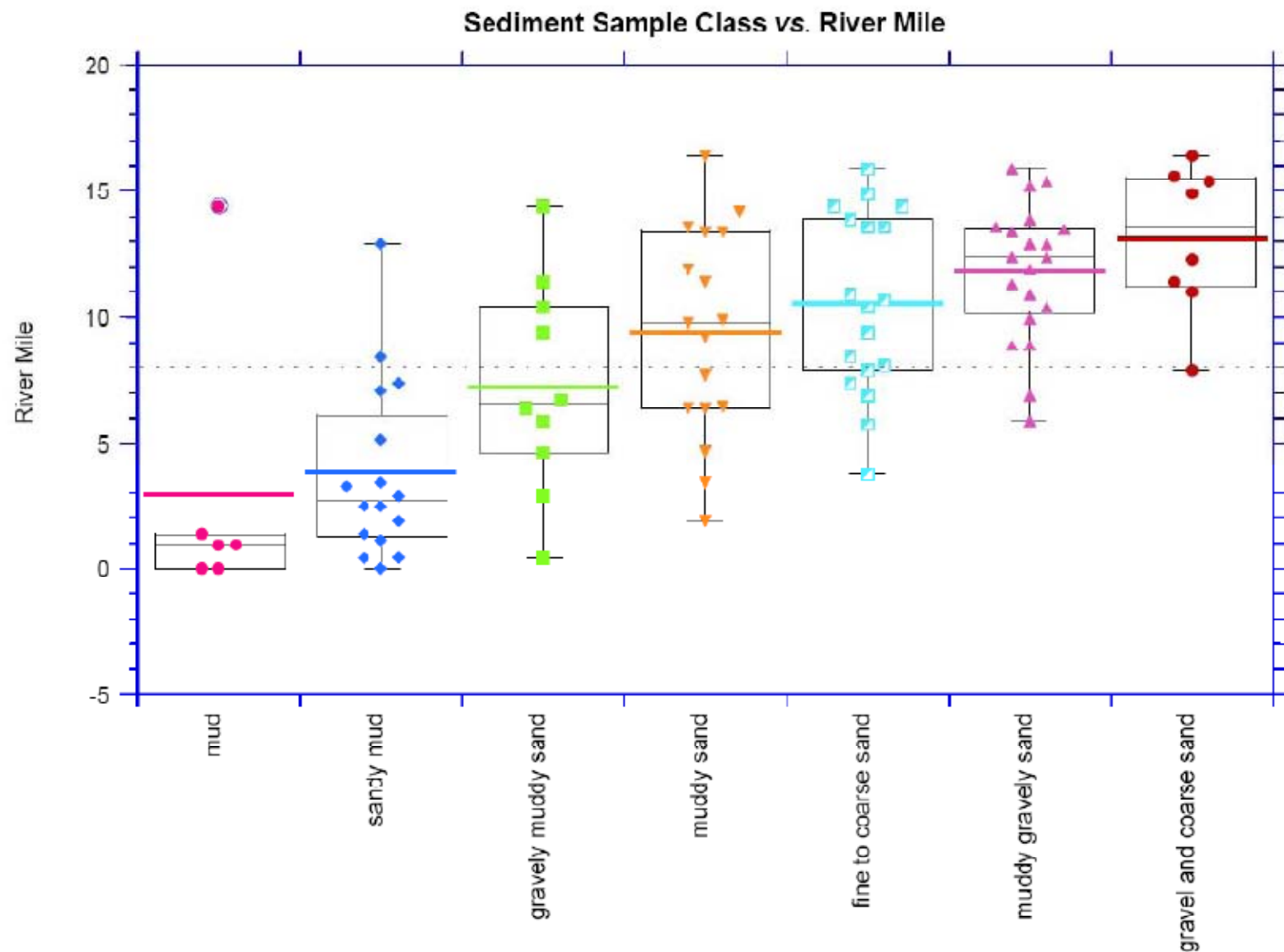


## Chapter 11 Figures





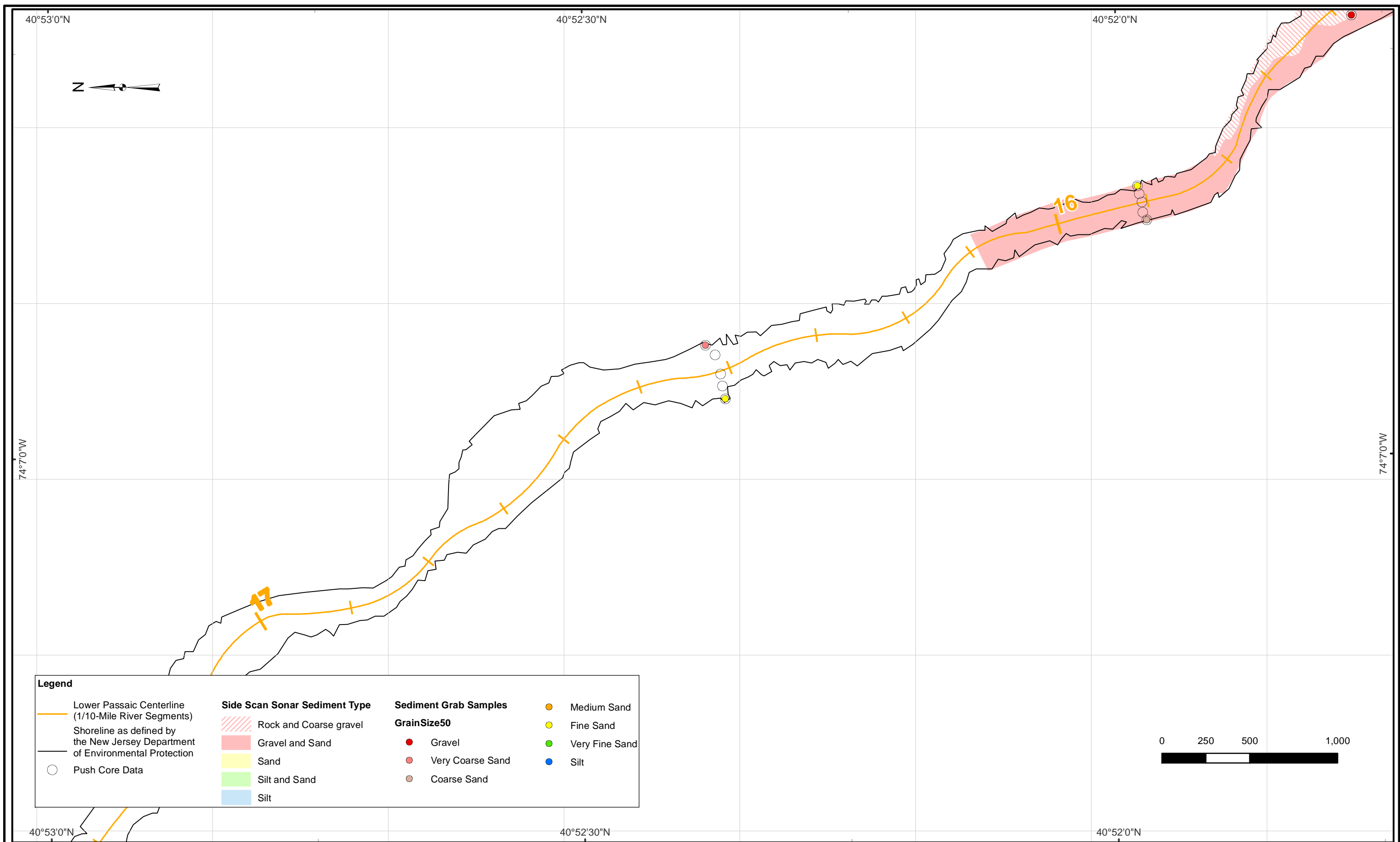
Sediment Sample Class by River Mile

*Lower Passaic River Restoration Project*

Figure 11-1

2009



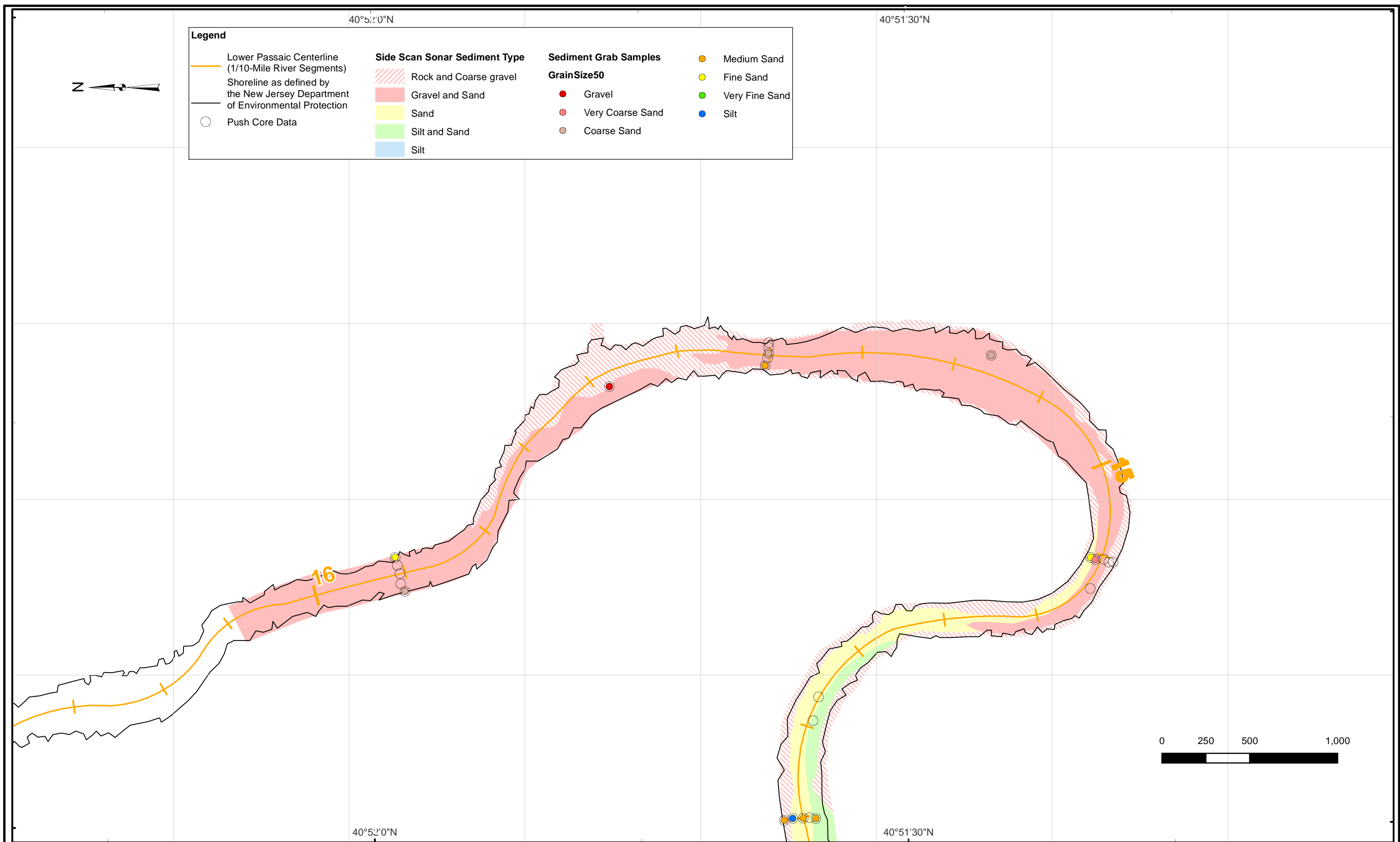


**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2a

2009



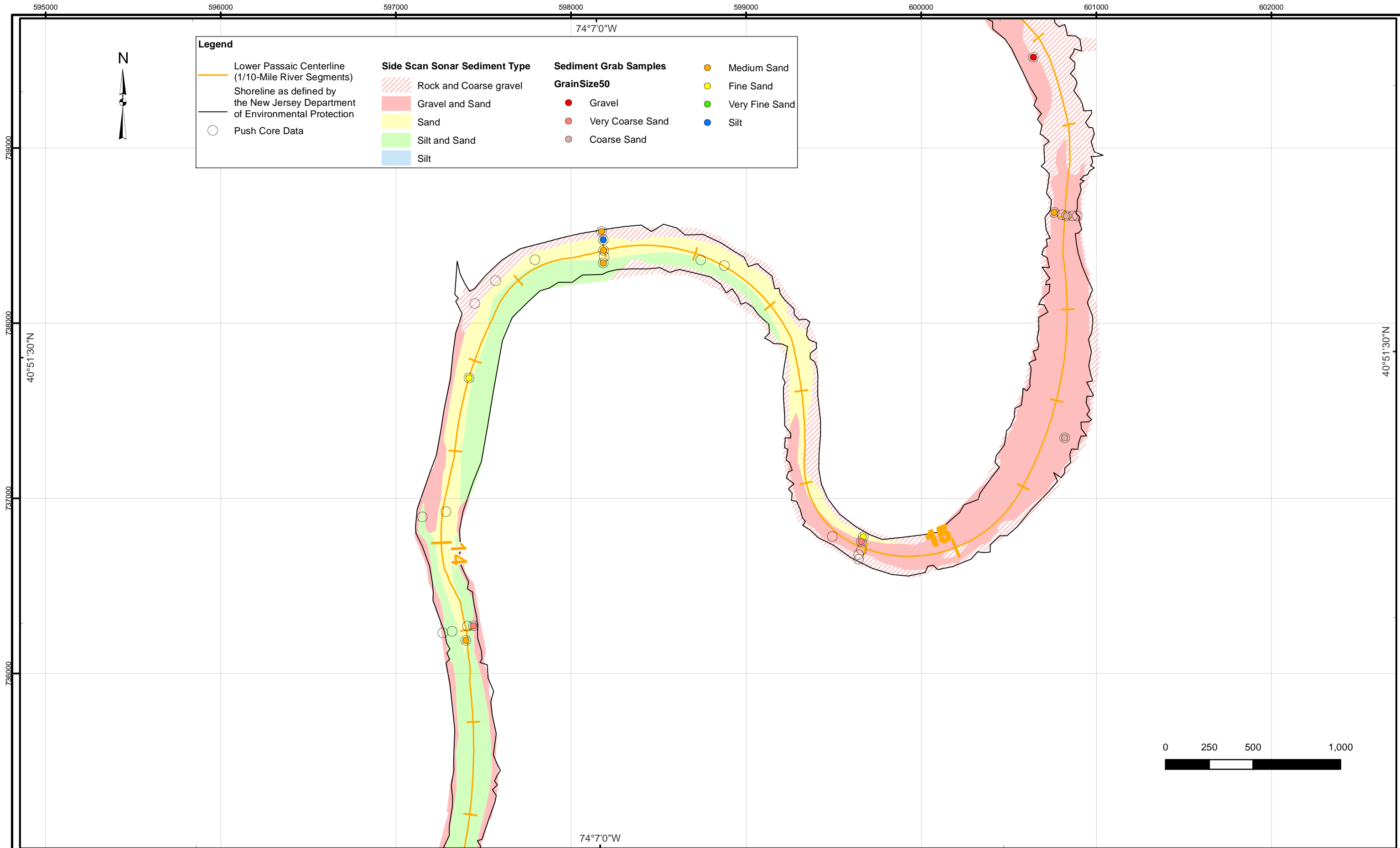


**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2b

2009

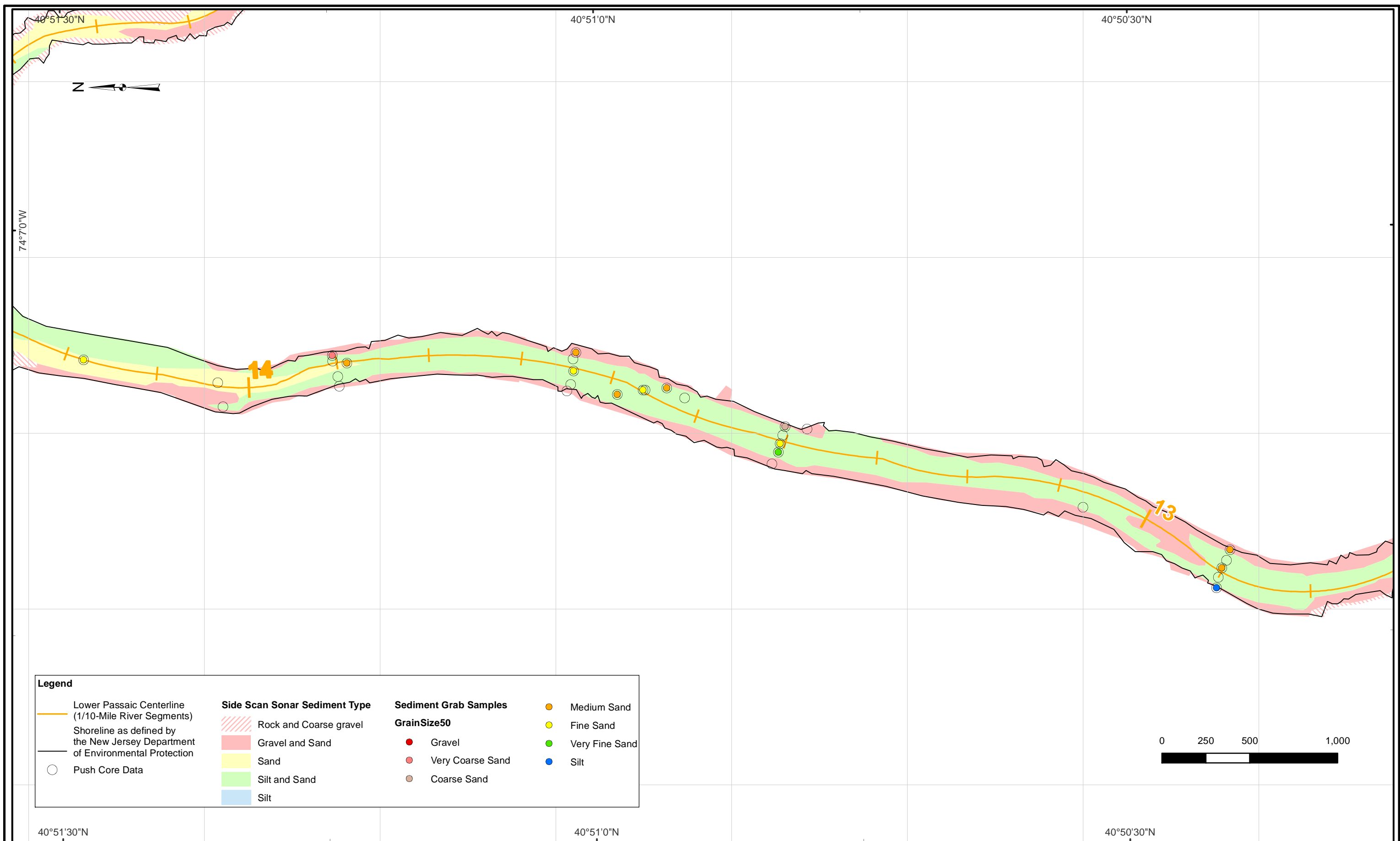




**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2c

2009

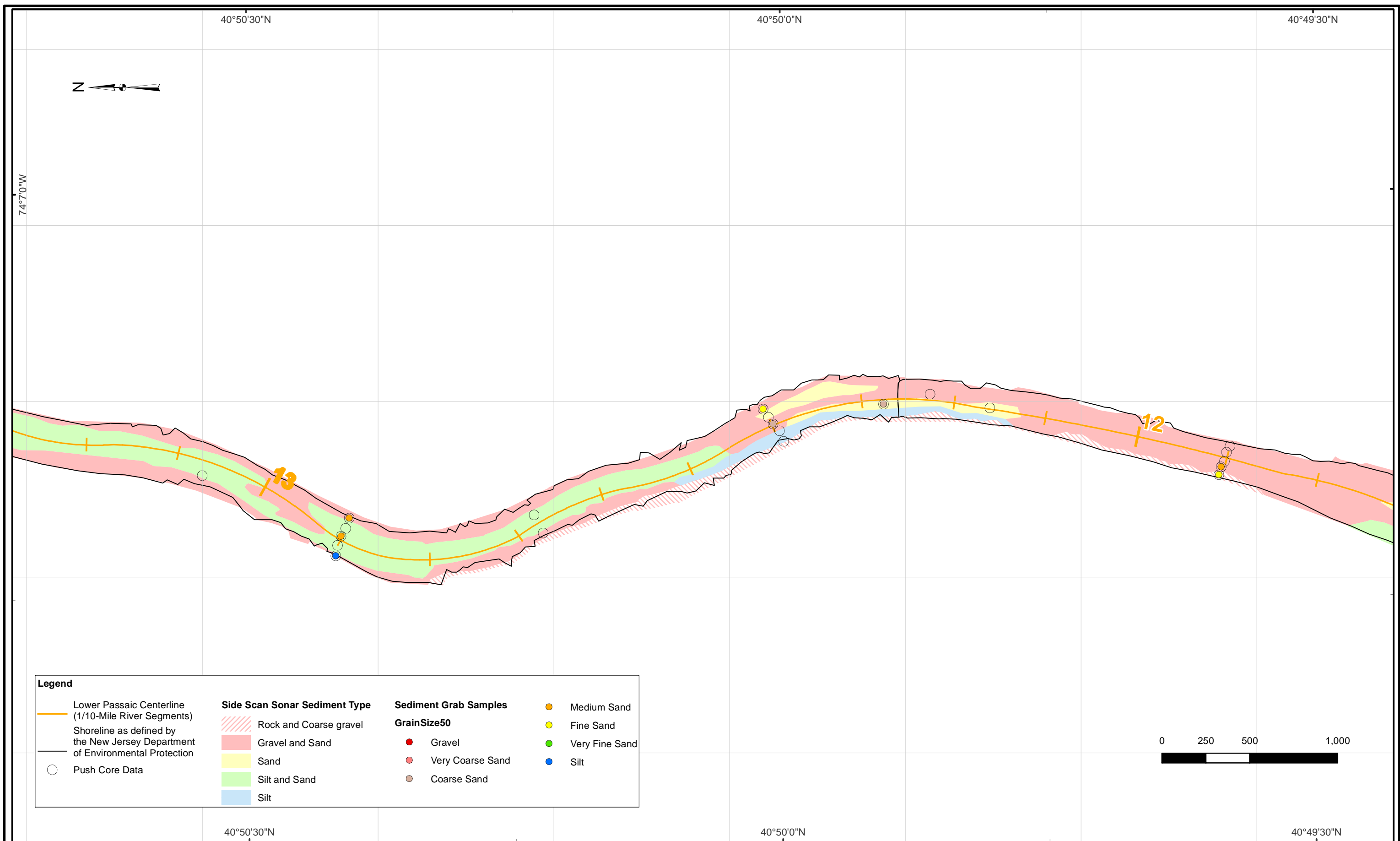


# Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples

Lower Passaic River Restoration Project

Figure 11-2d

2009

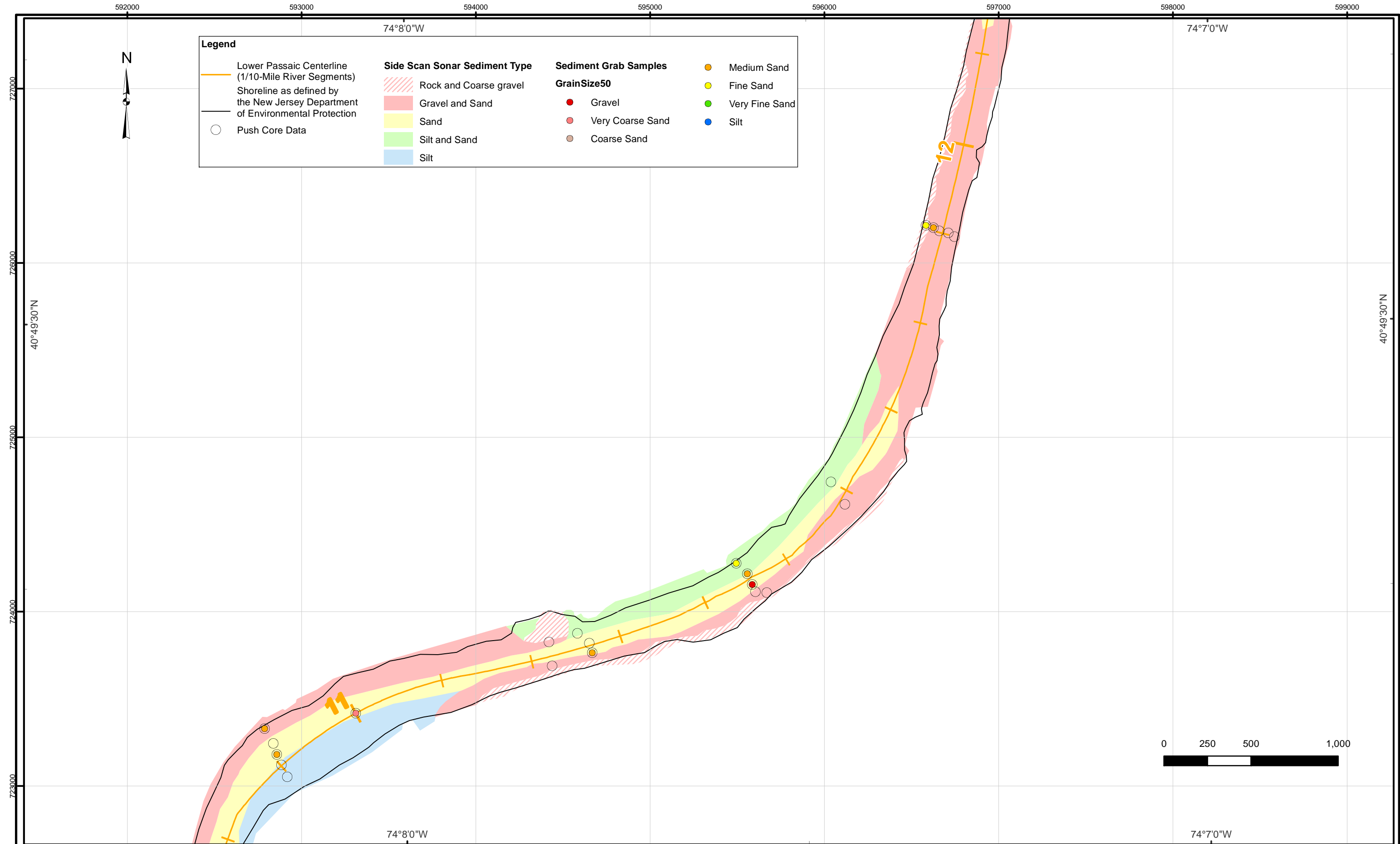


**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2e

2009

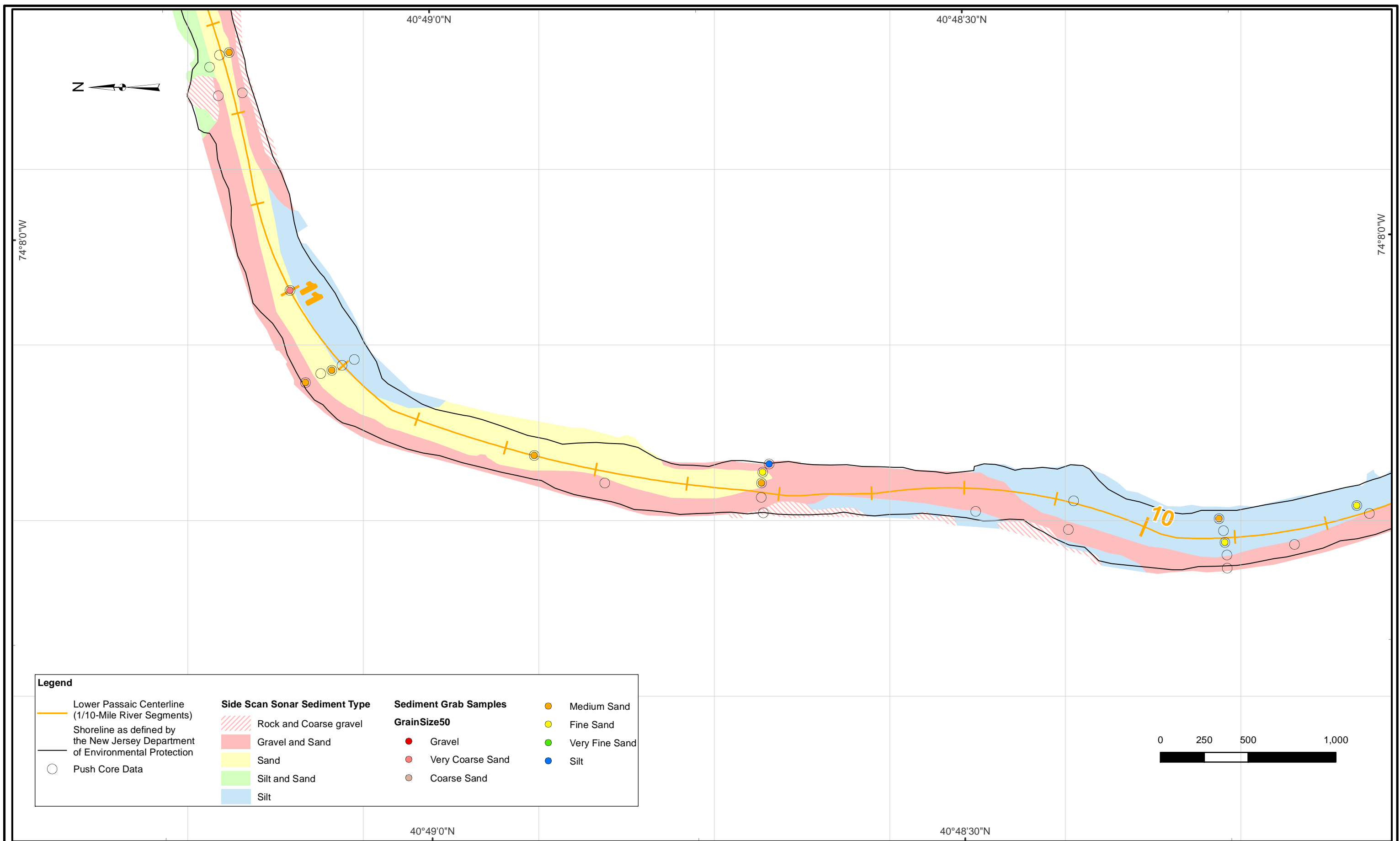




**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2f

2009



**Legend**

Lower Passaic Centerline  
(1/10-Mile River Segments)

Shoreline as defined by  
the New Jersey Department  
of Environmental Protection

○ Push Core Data

**Side Scan Sonar Sediment Type**

Rock and Coarse gravel

Gravel and Sand

Sand

Silt and Sand

Silt

**Sediment Grab Samples**

**GrainSize50**

Gravel

Very Coarse Sand

Coarse Sand

Medium Sand

Fine Sand

Very Fine Sand

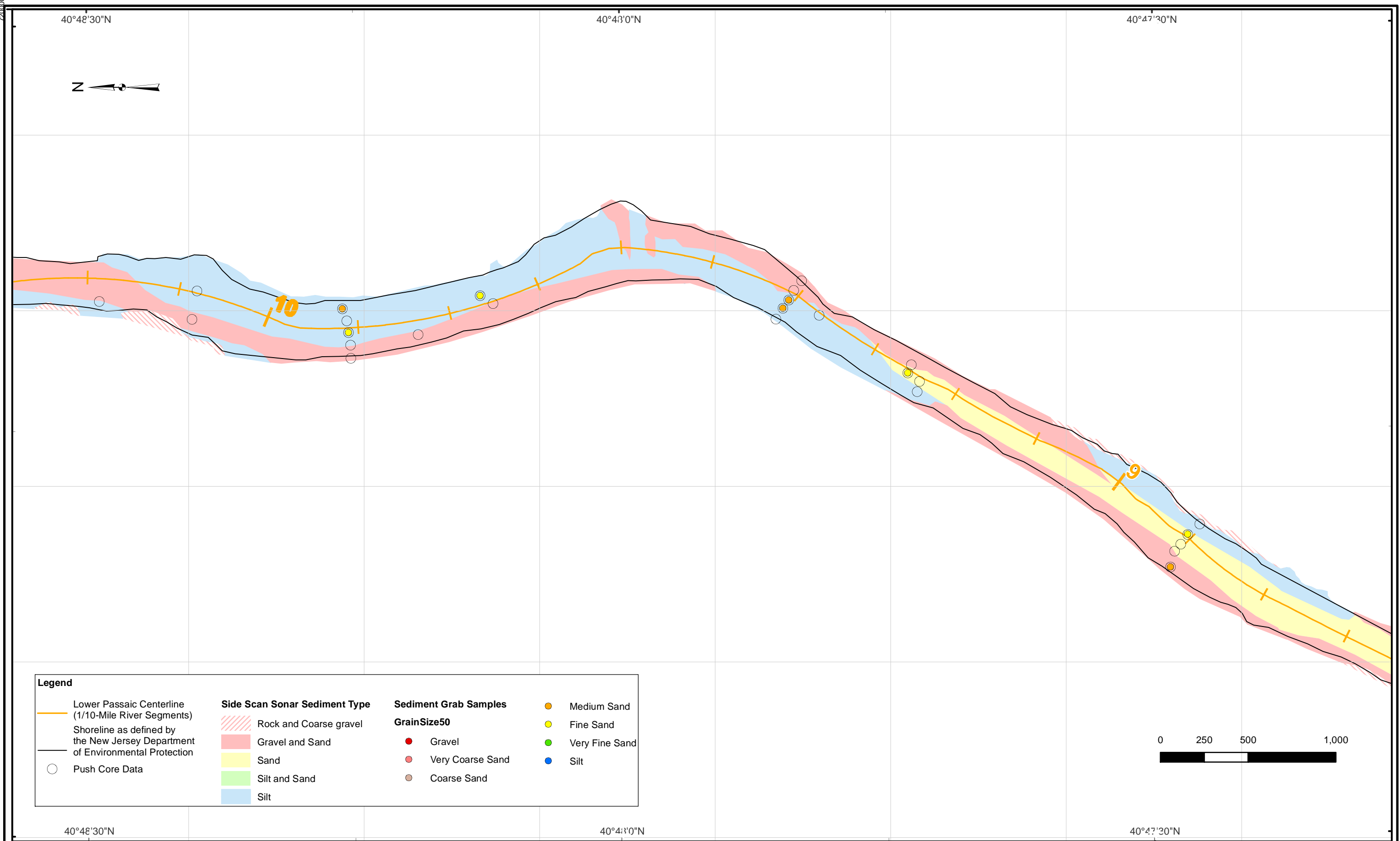
Silt

**Side Scan Sonar Sediment Domains and Associated  
Sediment Grab Samples**  
*Lower Passaic River Restoration Project*



Figure 11-2g

2009



**Legend**

Lower Passaic Centerline  
(1/10-Mile River Segments)

Shoreline as defined by  
the New Jersey Department  
of Environmental Protection

○ Push Core Data

**Side Scan Sonar Sediment Type**

Rock and Coarse gravel

Gravel and Sand

Sand

Silt and Sand

Silt

**Sediment Grab Samples**  
**GrainSize50**

Gravel

Very Coarse Sand

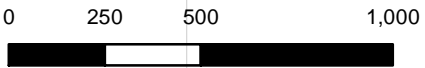
Coarse Sand

Medium Sand

Fine Sand

Very Fine Sand

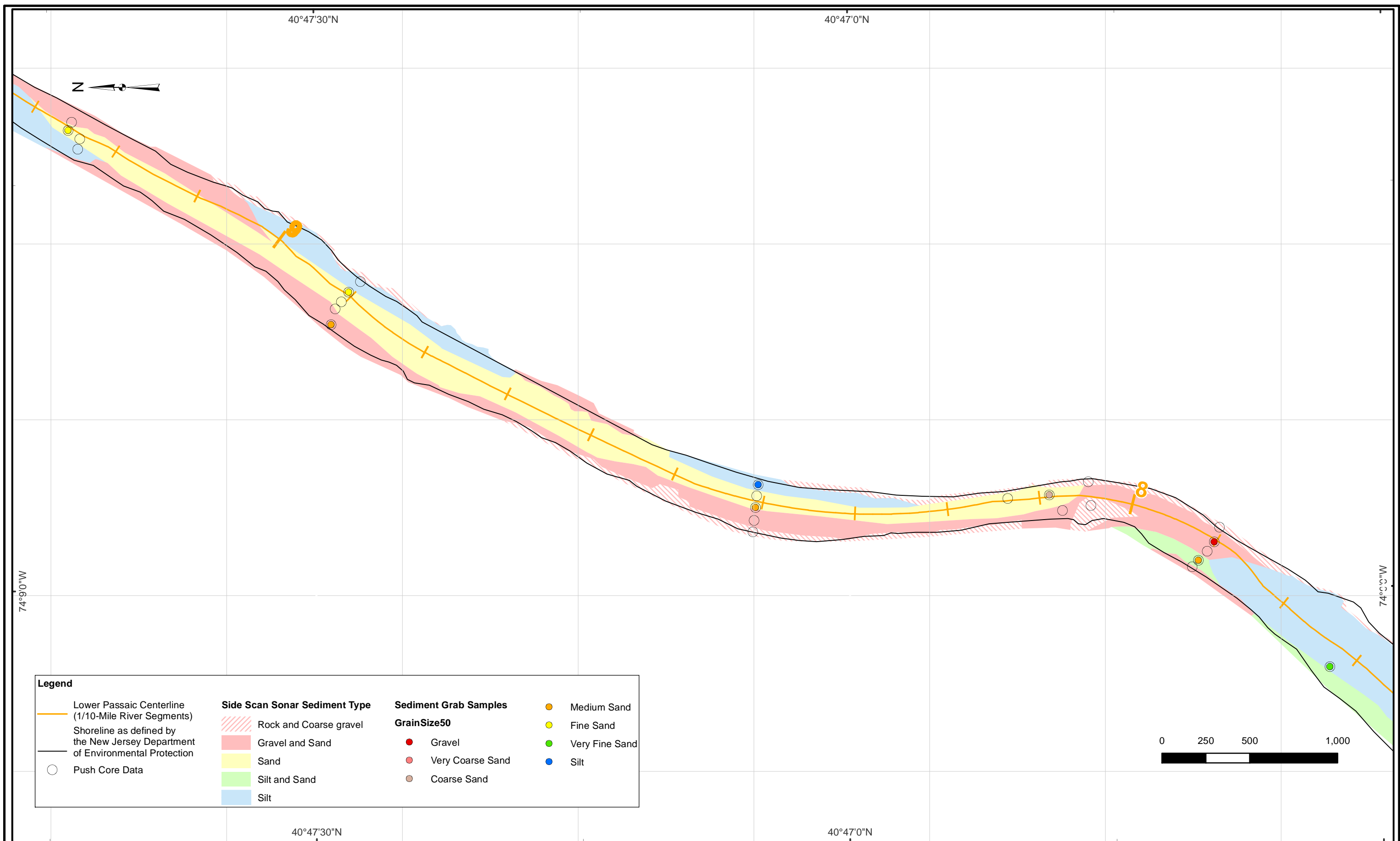
Silt



**Side Scan Sonar Sediment Domains and Associated  
Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2h  
2009



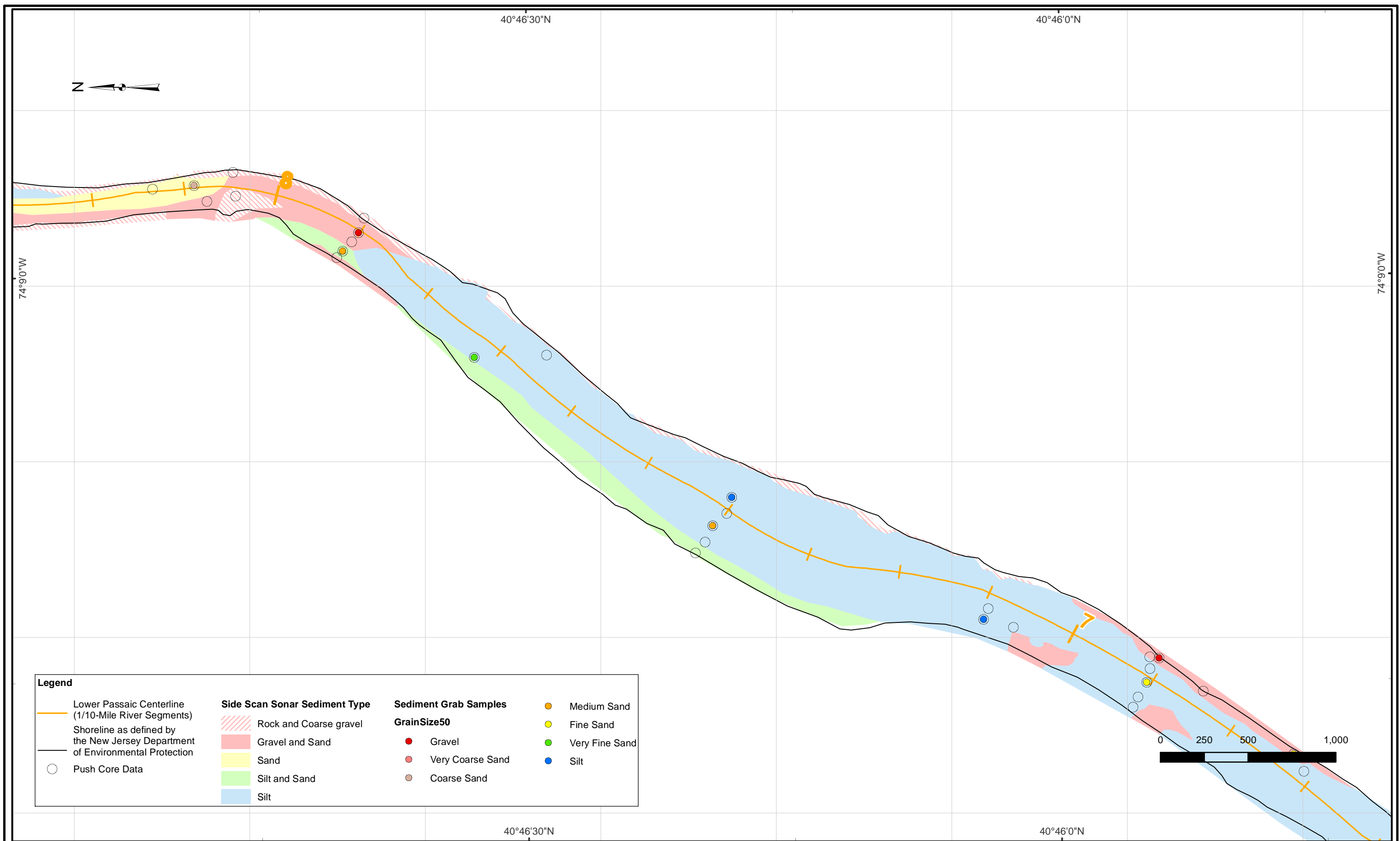


**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2i

2009



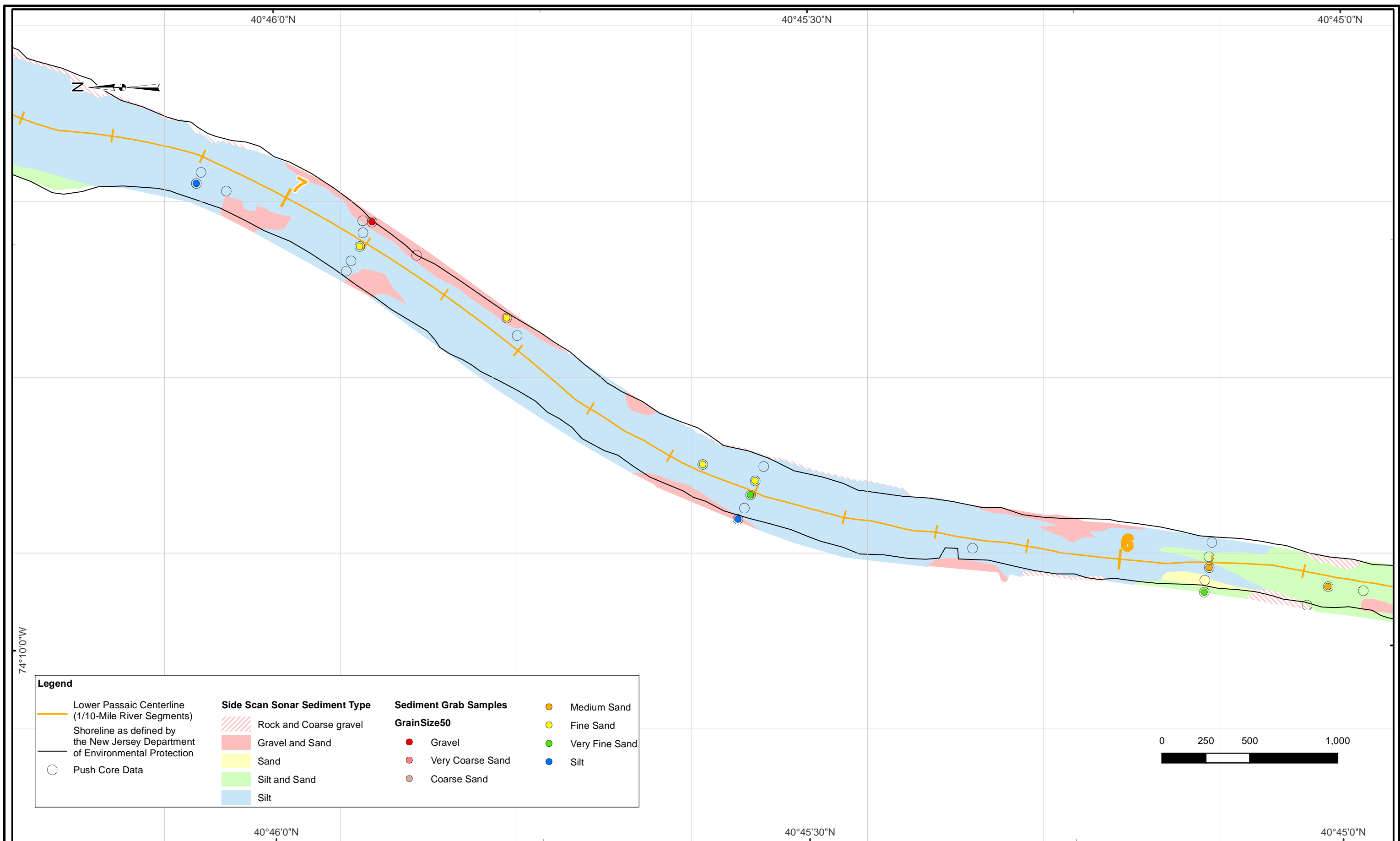


**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2j

2009



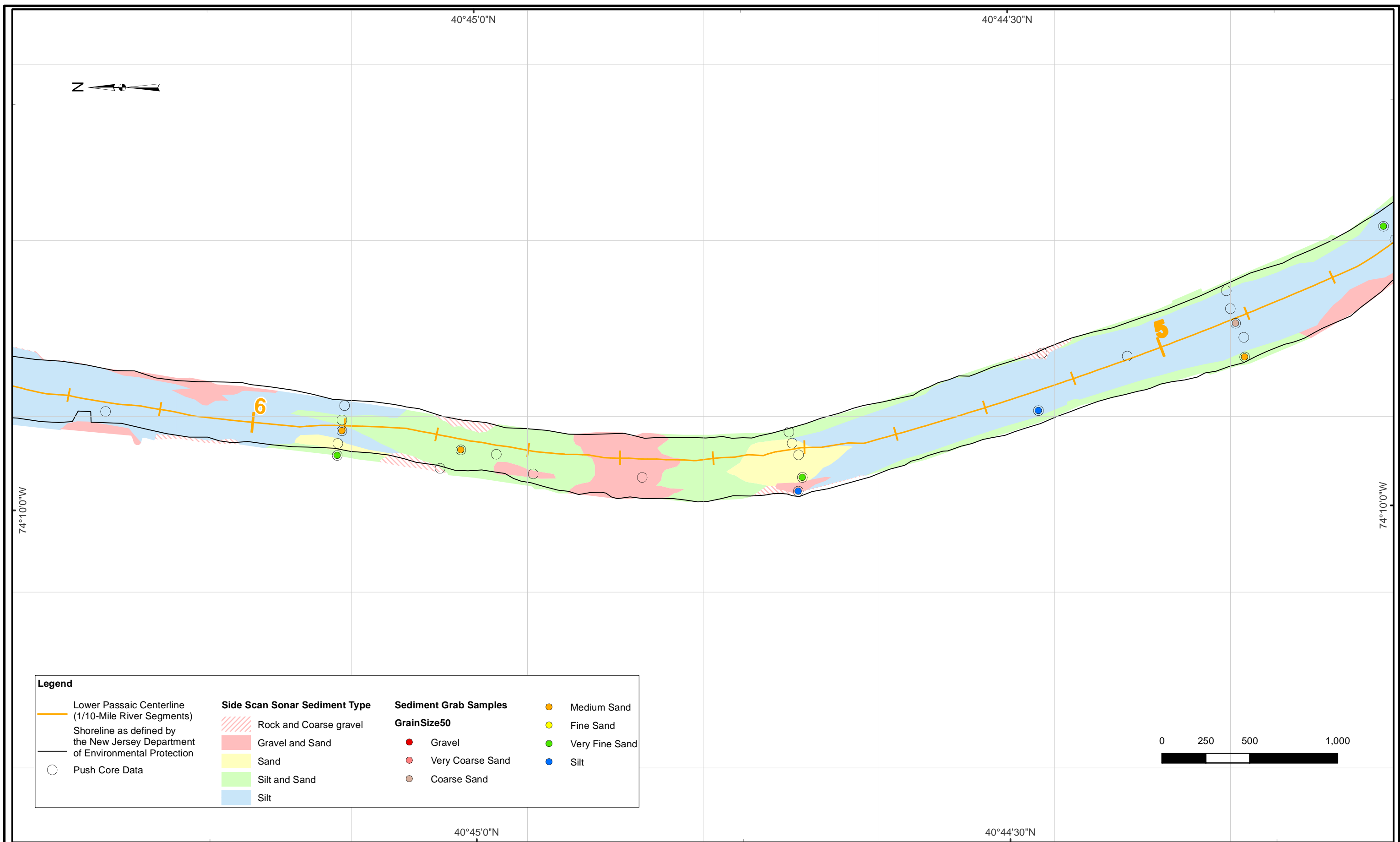


**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2k

2009



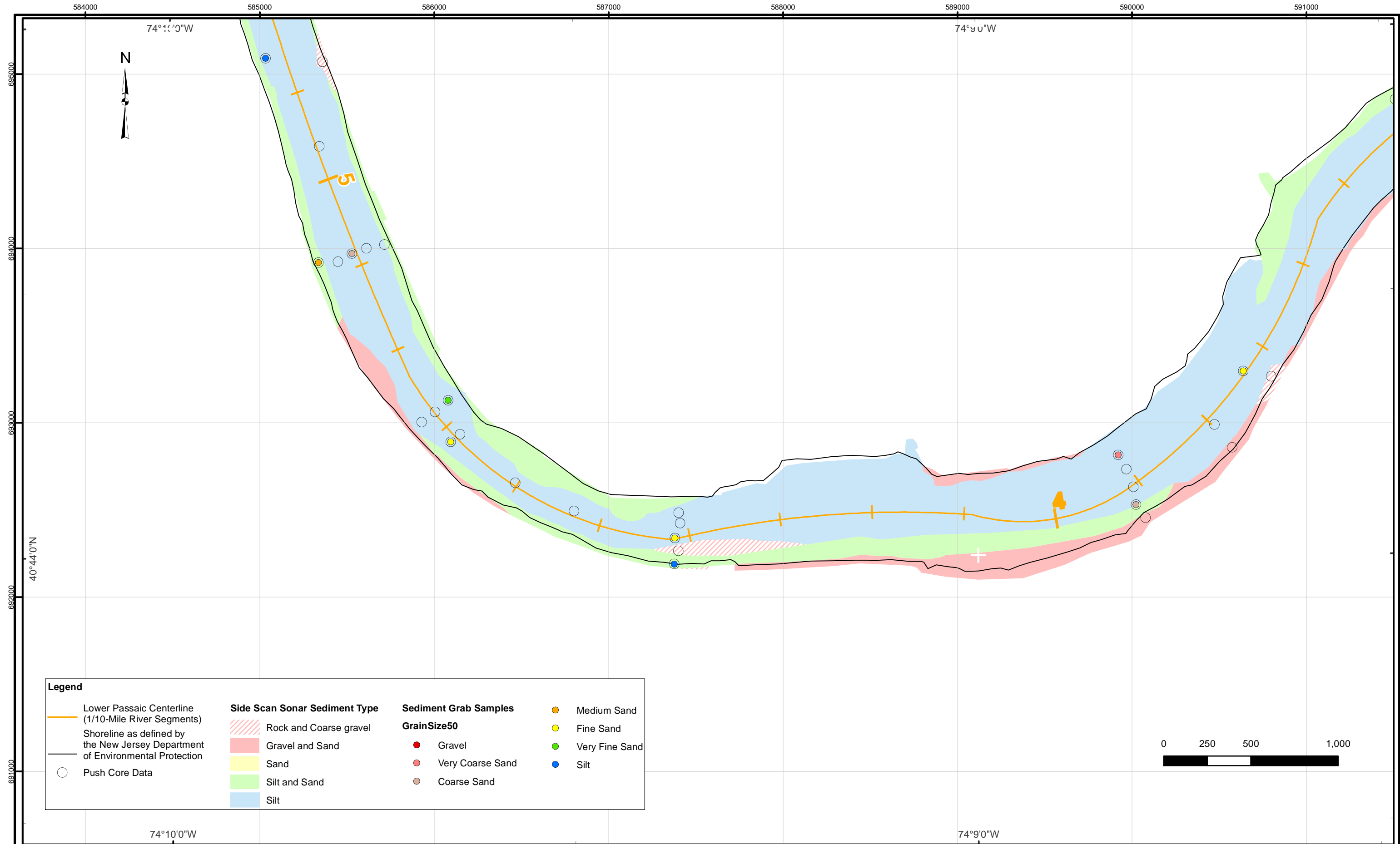


**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2I

2009

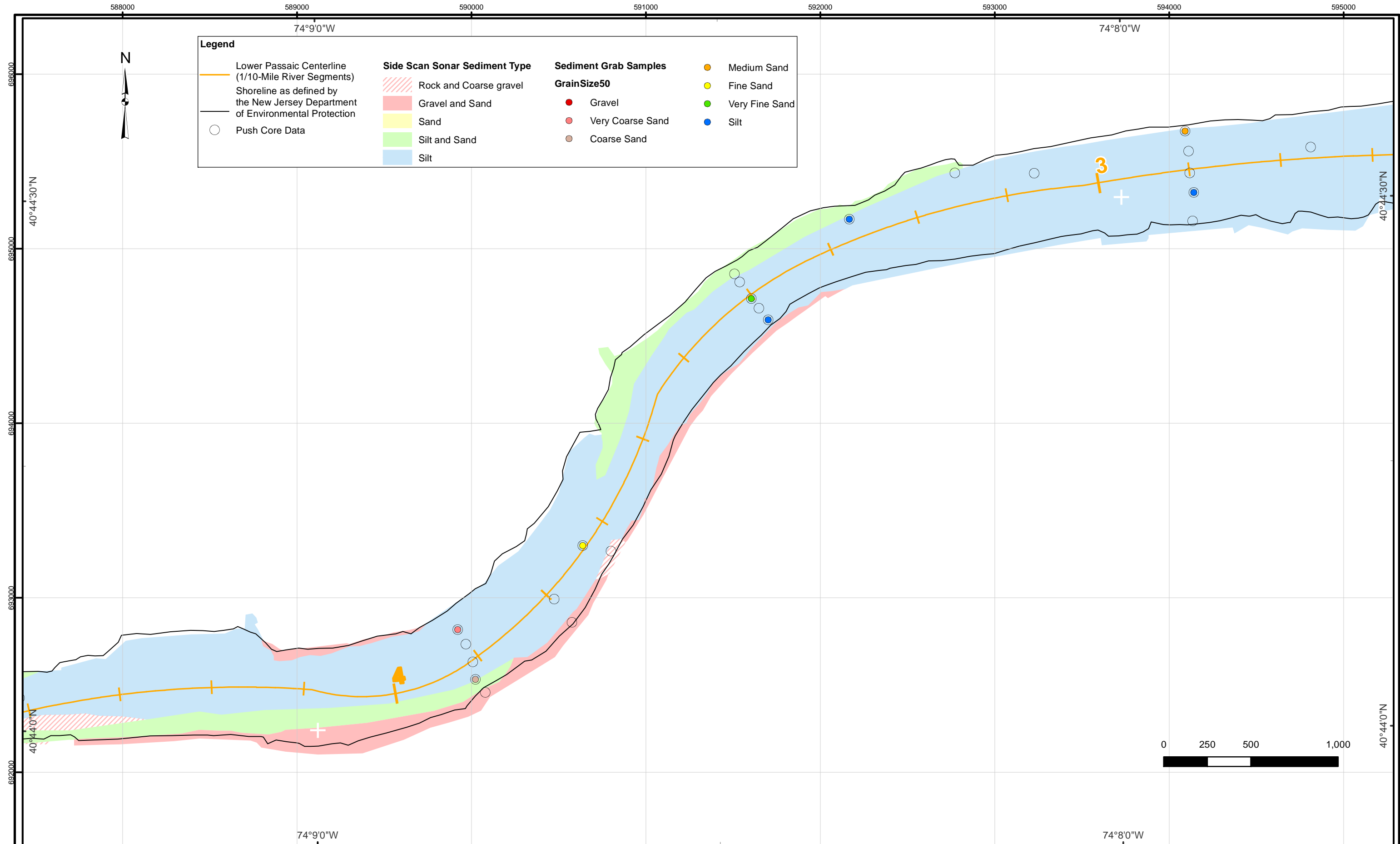




**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2m

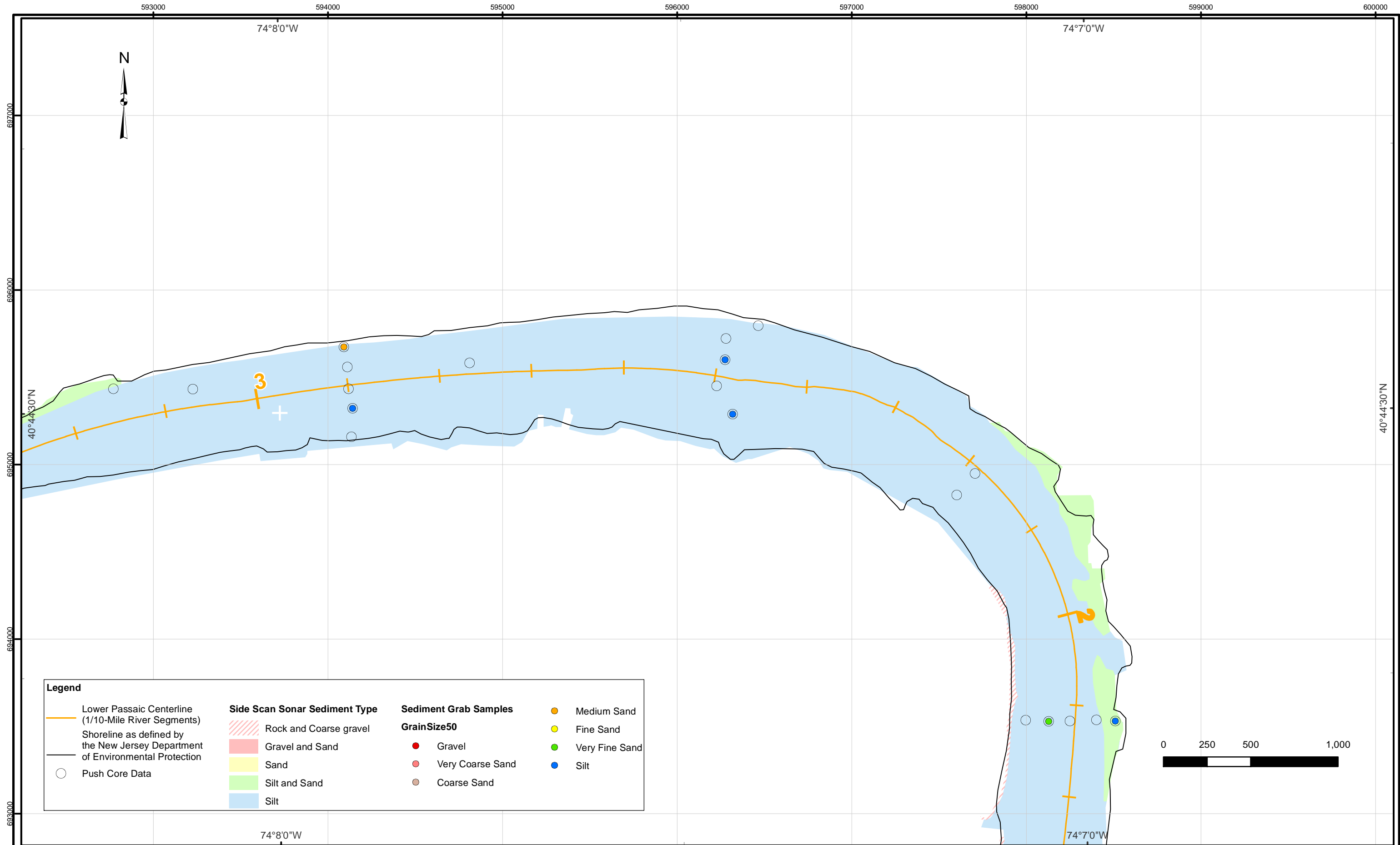
2009



**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2n

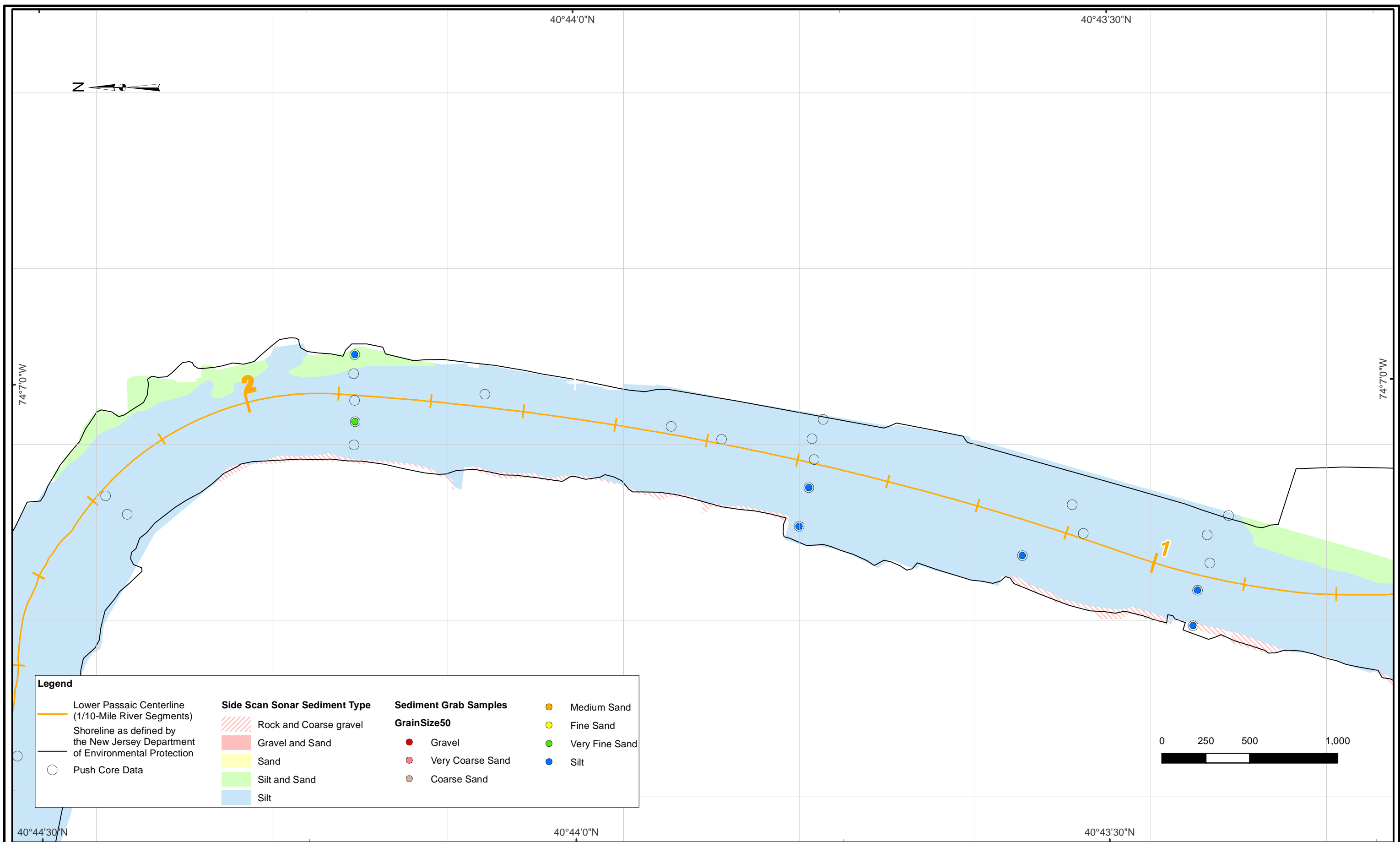
2009



**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2o

2009



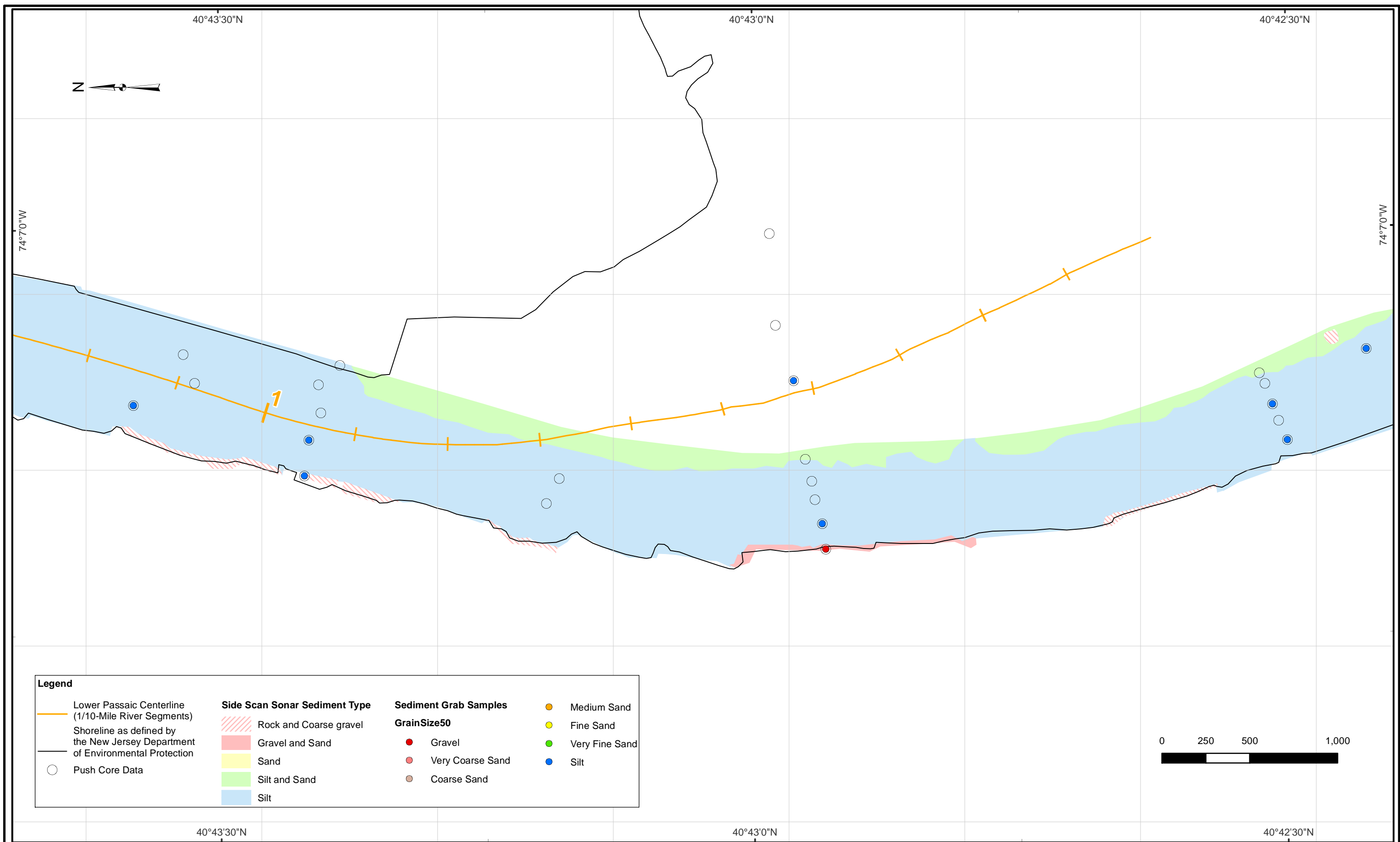
**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2p

2009



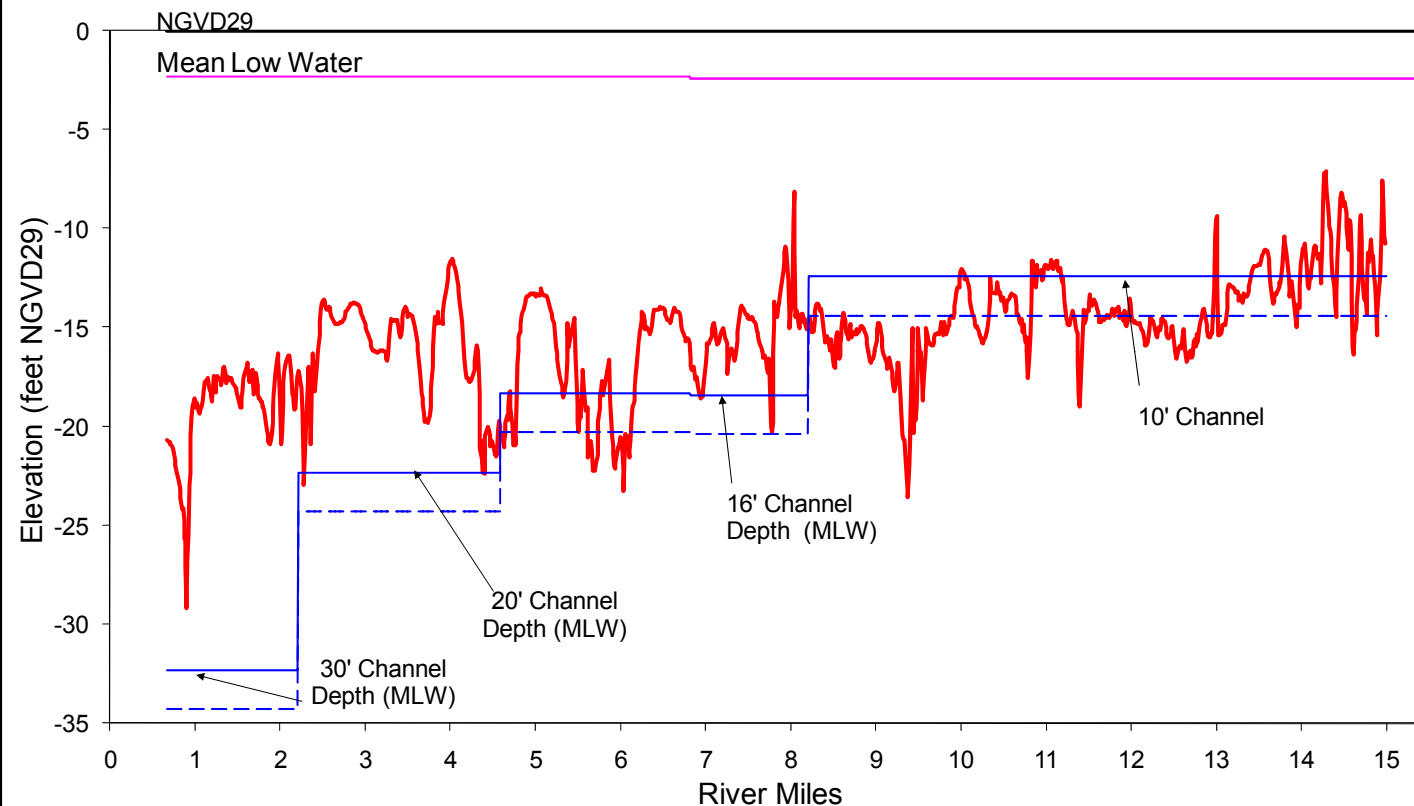




**Side Scan Sonar Sediment Domains and Associated Sediment Grab Samples**  
*Lower Passaic River Restoration Project*

Figure 11-2q

2009



## Legend

- Navigational Channel Centerline Bathymetry
- Navigational Channel Depth
- - - Navigational Channel Depth + 2 feet

## Notes

Channel depths were dredged relative to mean low water (MLW). The difference between NGVD29 and MLW is approximately 2.3 feet.

Solid blue line represents federally mandated channel depth.

Dashed blue line represents the channel depth +2 feet which would have been the dredged depth in order to maintain the federally specified channel depth.

Elevation data estimated from 2004 bathymetric data surveyed by Rogers Survey, Inc. for USACE.

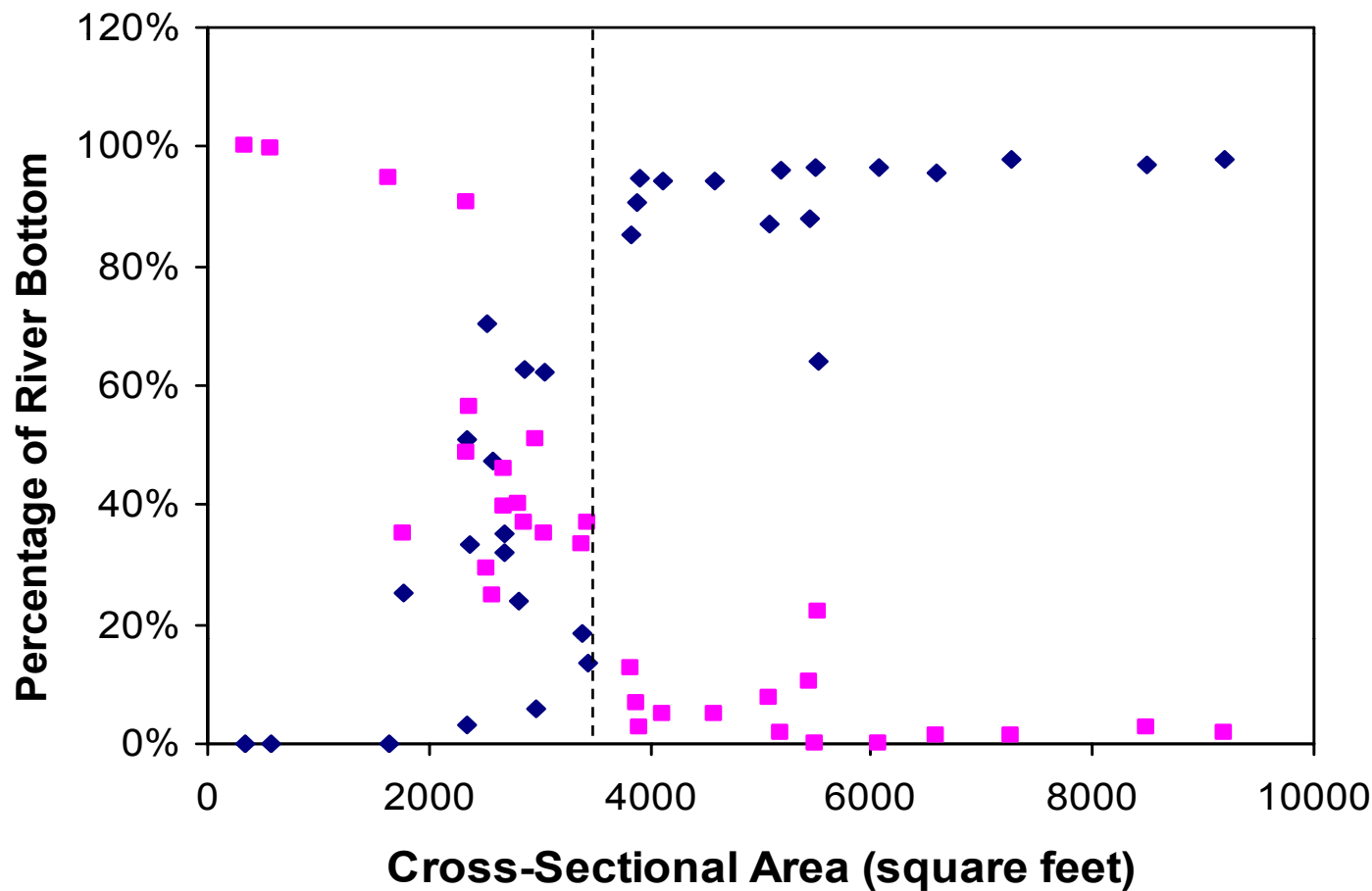


## River Bottom Elevation and Authorized Channel Depths

*Lower Passaic River Restoration Project*

Figure 11-3

2009



## Legend

- ◆ Fine-grained sediment
- Coarse-grained sediment

Highlights the change to a river cross sectional area of 3,500 square feet

## Notes

Cross-sectional area estimated from 2004 bathymetric data surveyed by Rogers Survey, Inc. for USACE.

Sediment texture was evaluated based on data interpolated by Aqua Survey, Inc. using side-scan sonar images (Aqua Survey, Inc., 2006). Sediment texture data extends from RM0 to RM16.5.

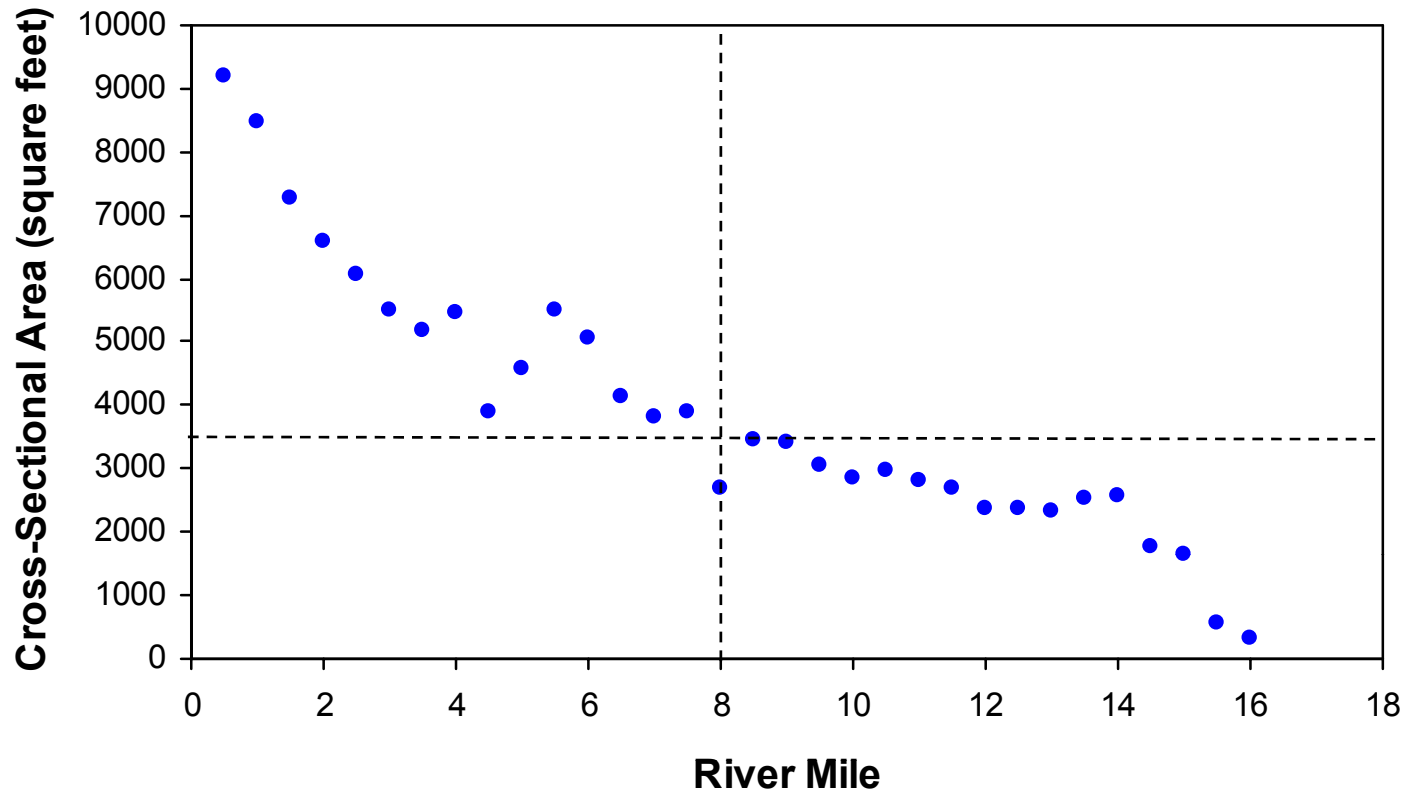
Refer to Figure 1-6 for relationship between river mile and cross-sectional area.



Variation of Lower Passaic River Sediment Type with River Cross-Sectional Area  
Lower Passaic River Restoration Project

Figure 11-4

2009



## Legend

- Cross-Sectional Area (square feet)

-- Highlights the change to a river cross sectional area of 3,500 square feet at RM8

## Notes

Cross-sectional area estimated from 2004 bathymetric data surveyed by Rogers Survey, Inc. for USACE.

Cross-sectional area refers to the water filled area of the river channel when water level is equal to 0 feet elevation at NGVD29.

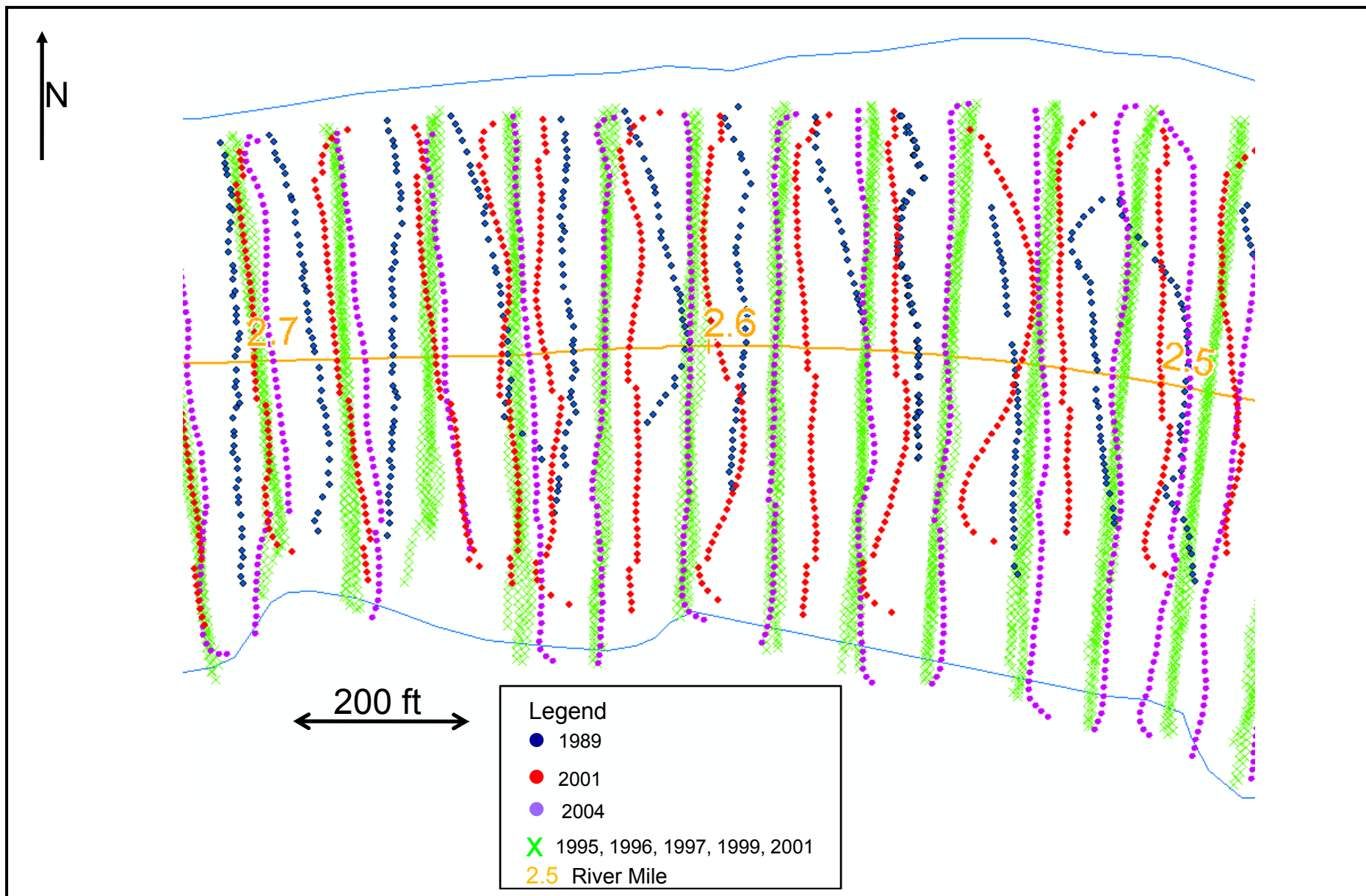


Variation of Lower Passaic River Cross-Sectional Area with River Mile

*Lower Passaic River Restoration Project*

Figure 11-5

2009

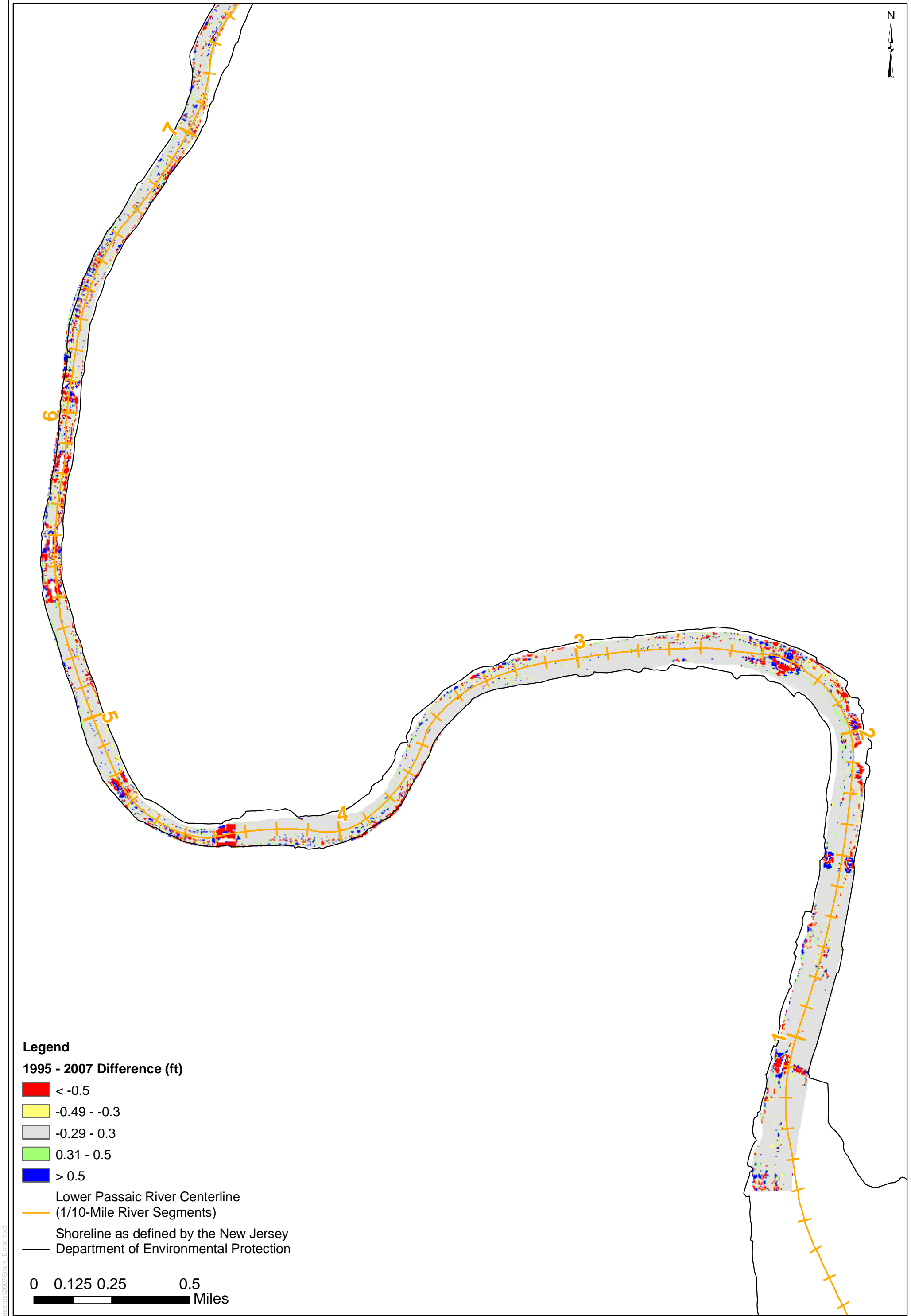


Alignment of Bathymetric Track Lines  
For 1989 to 2004 Surveys

*Lower Passaic River Restoration Project*

Figure 11-6

2009

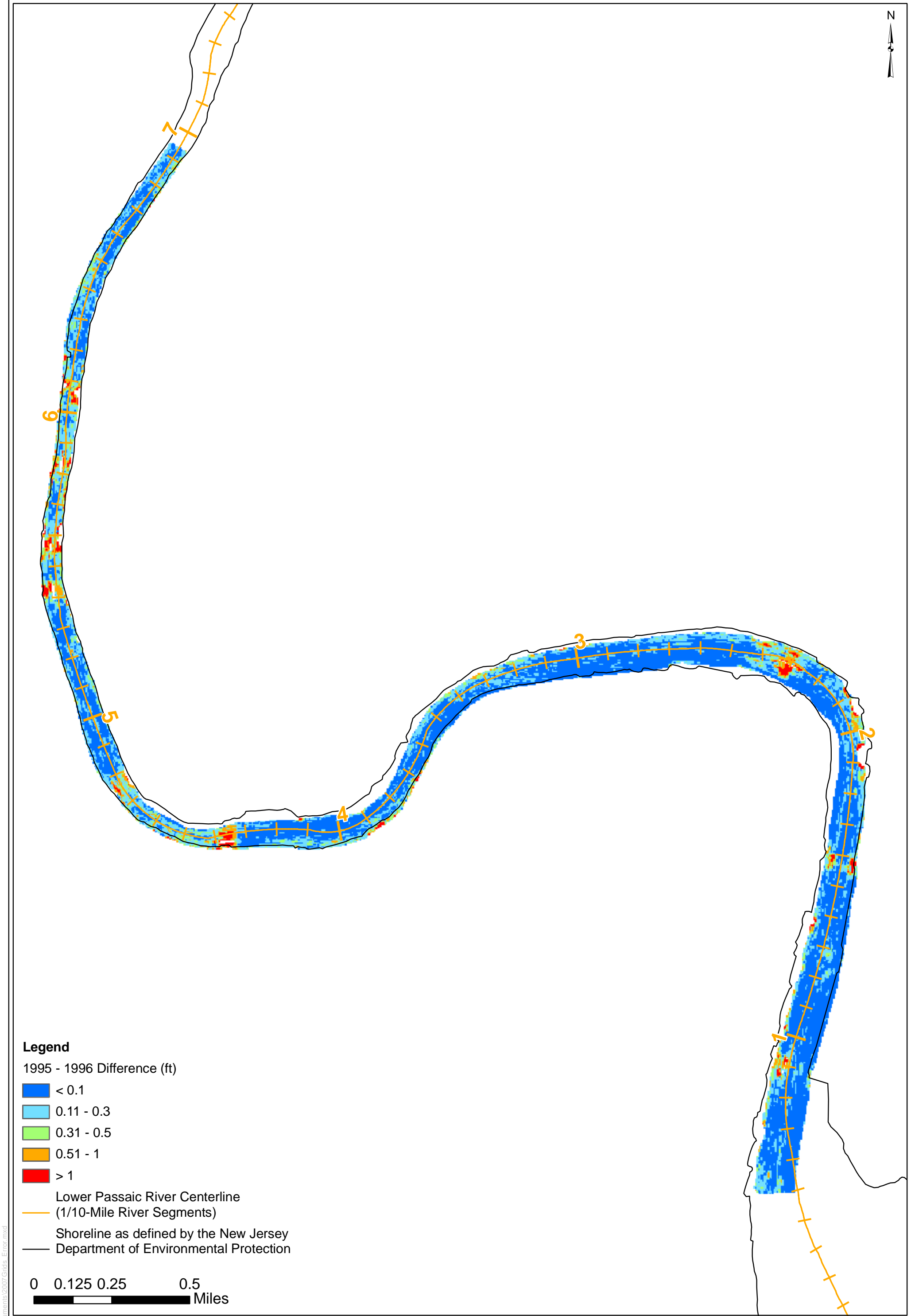


# TIN to 2007 Grid Uncertainty Evaluation

Lower Passaic River Restoration Project

Figure 11 - 7a

2009



S:\Projects\PA\SAIC\MapDocuments\2007\Grids\_Error.mxd



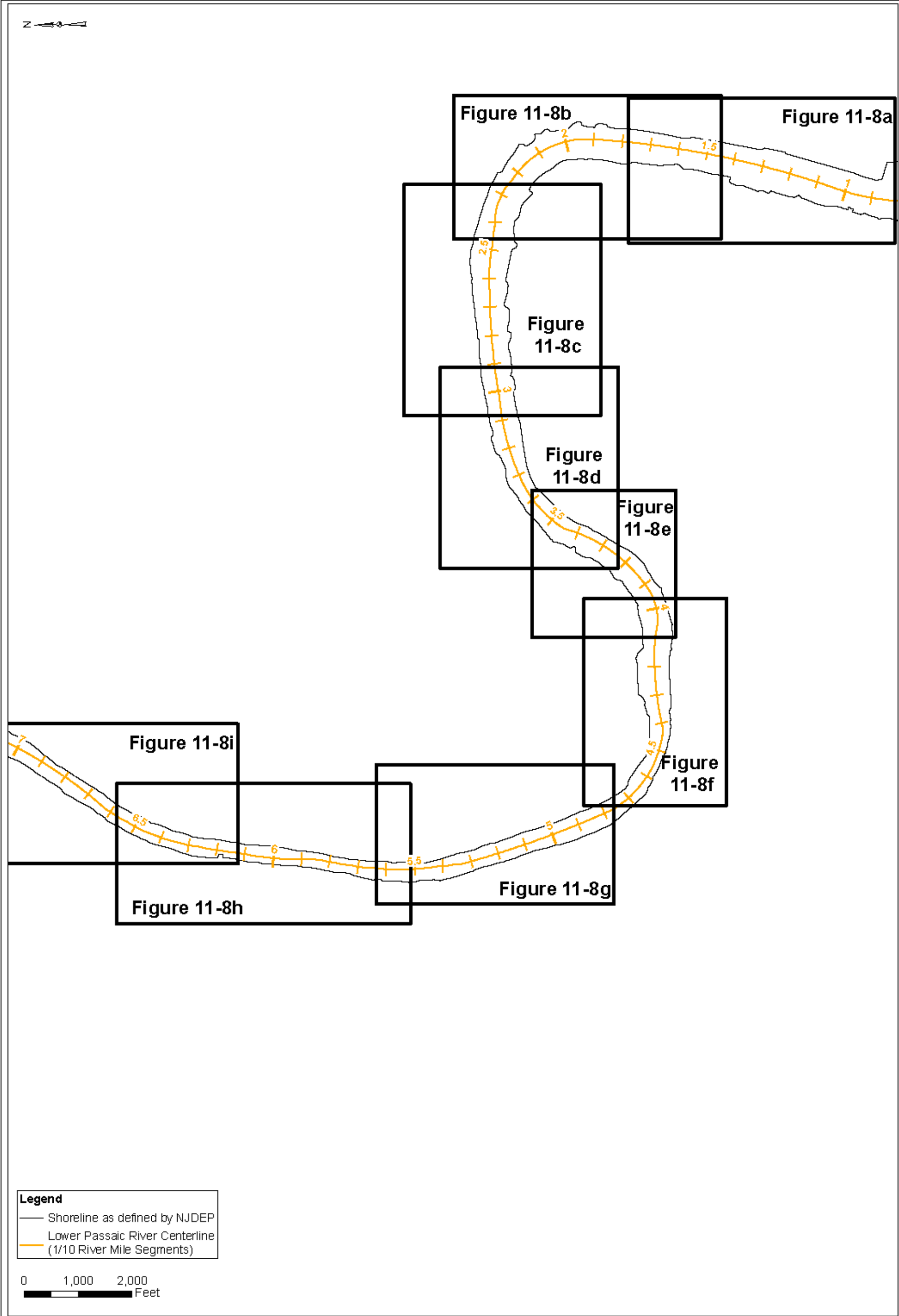
# TIN to TIN Uncertainty Evaluation

Lower Passaic River Restoration Project

Figure 11 - 7b

2009





**Sedimentation Rate (1995 to 2004)**  
*Lower Passaic River Restoration Project*



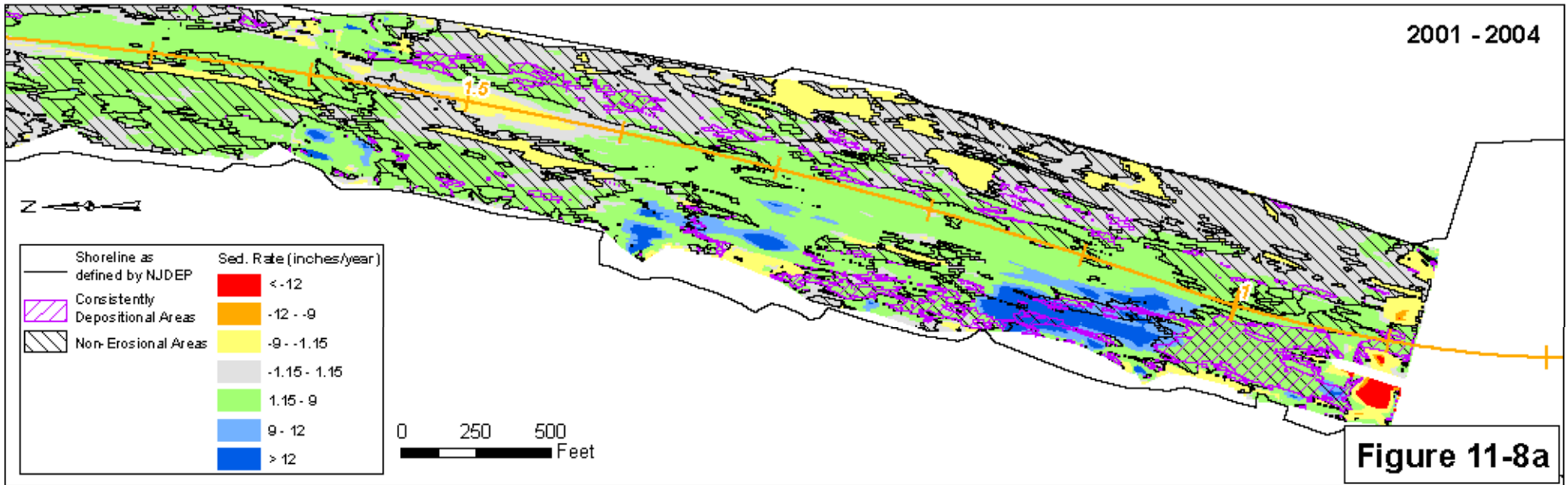
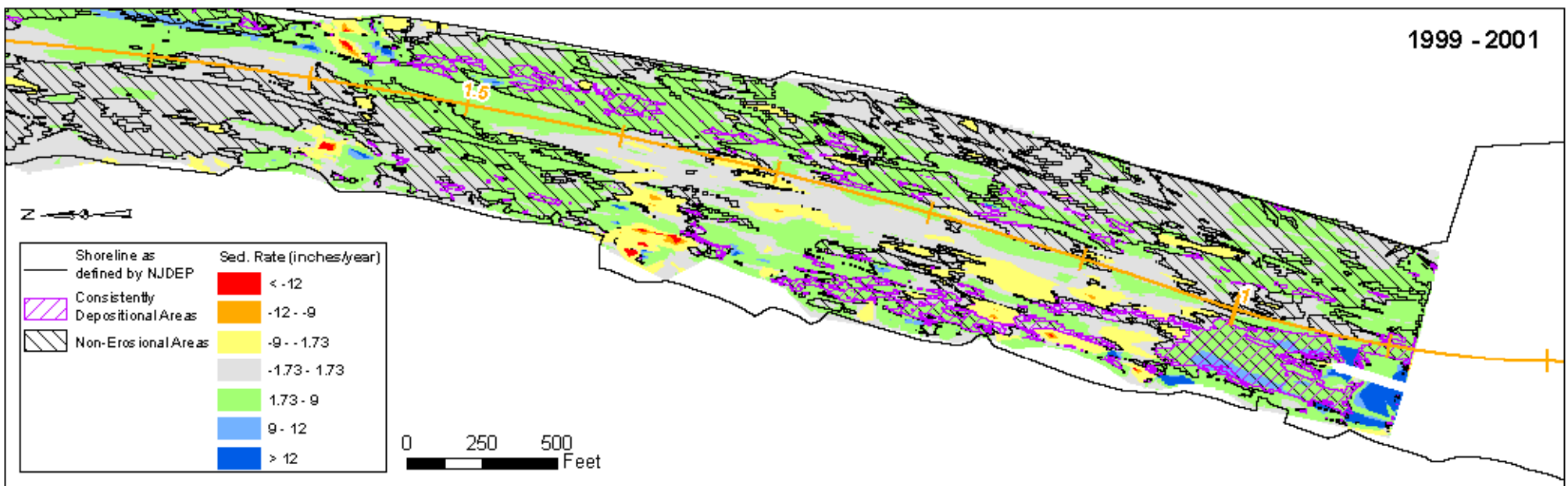
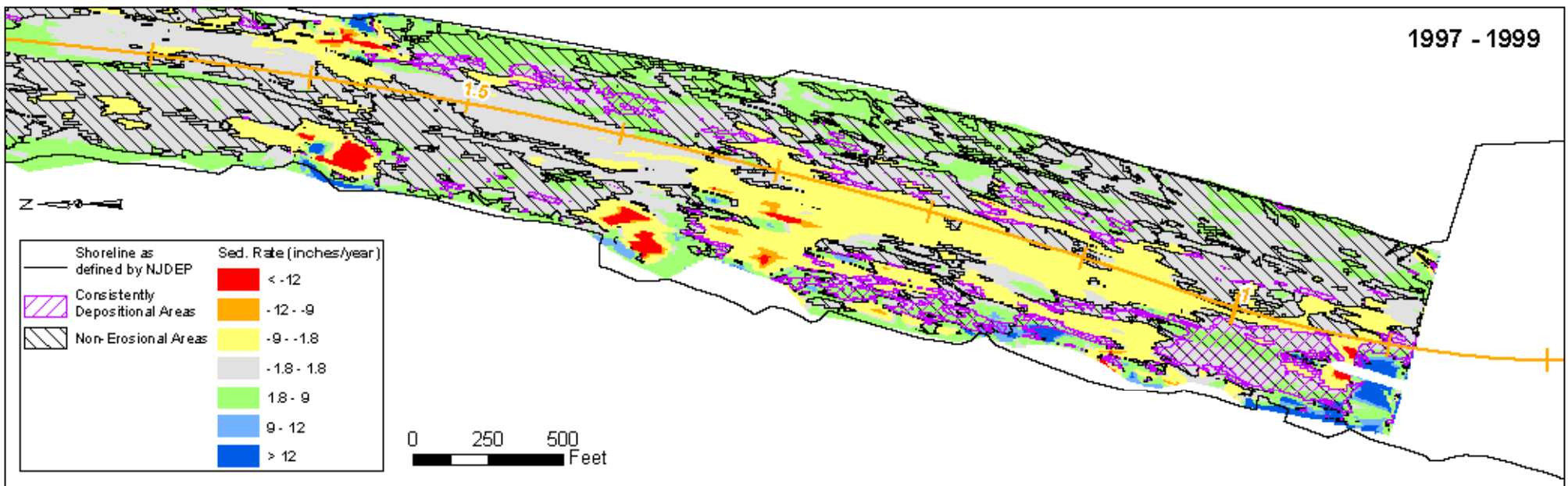
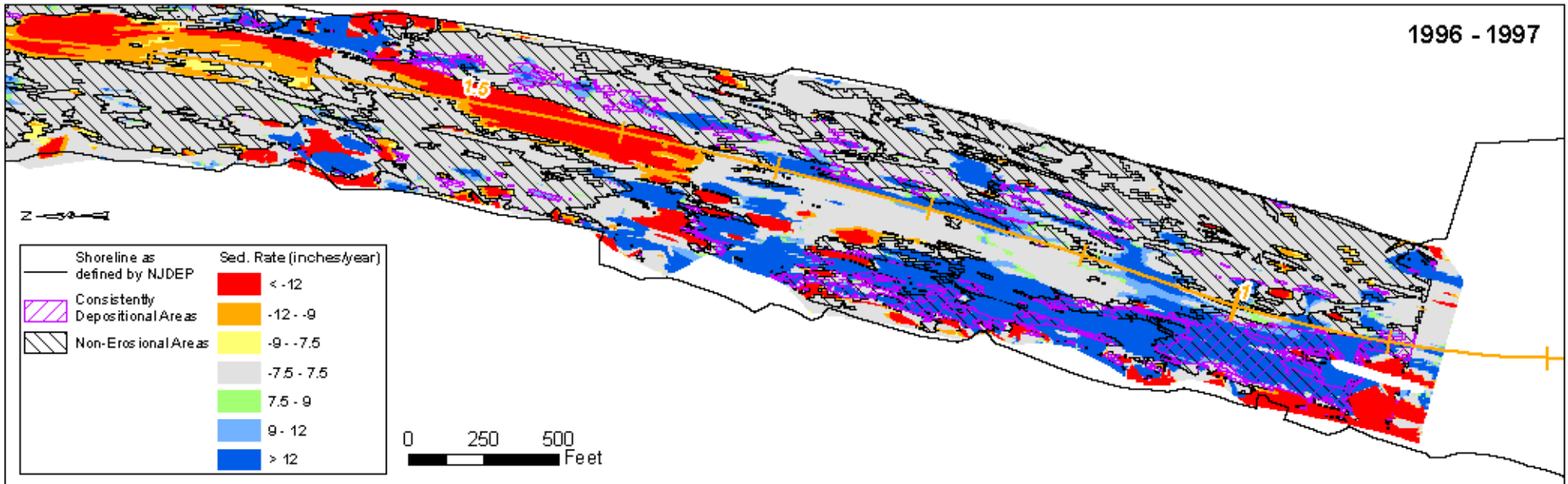
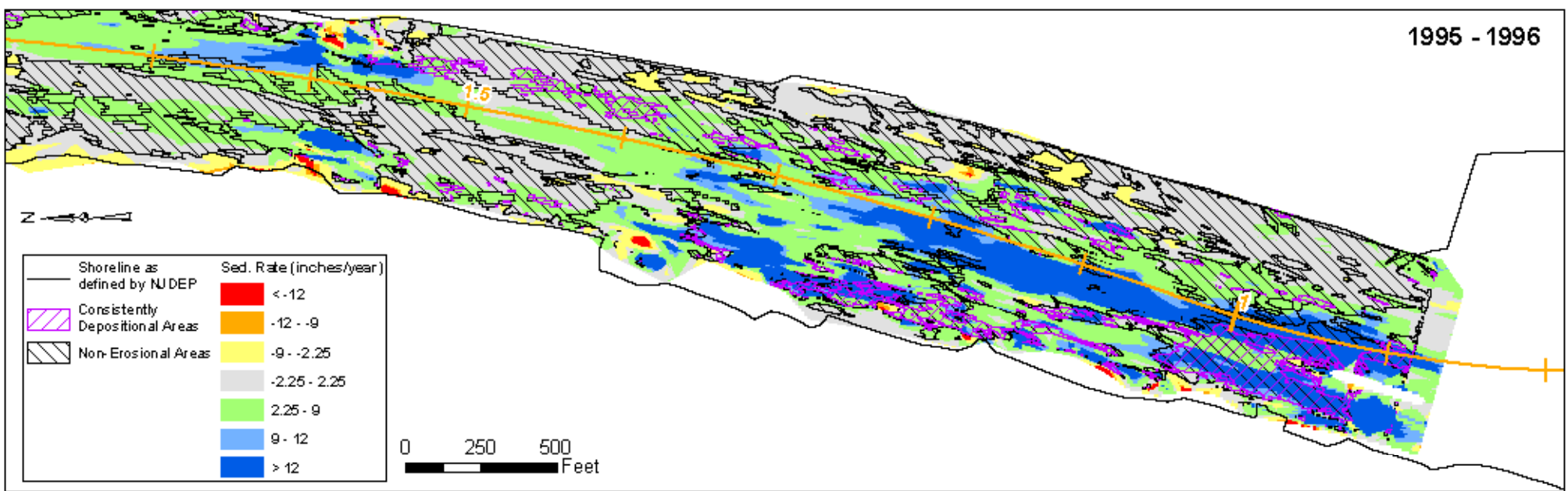


Figure 11-8a



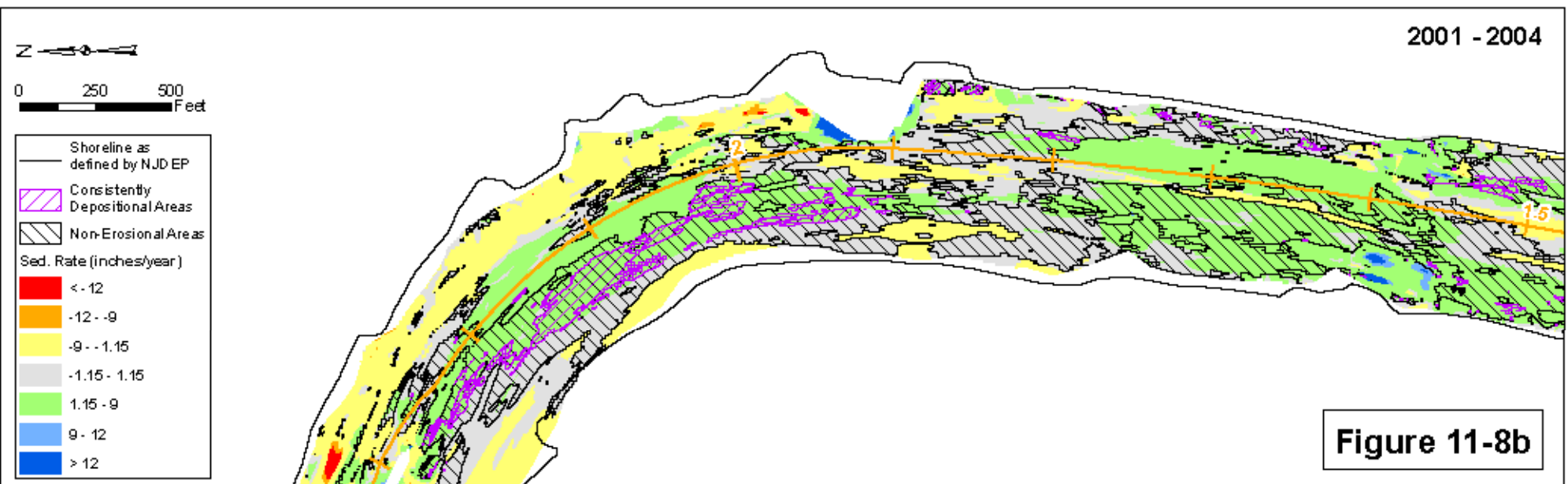
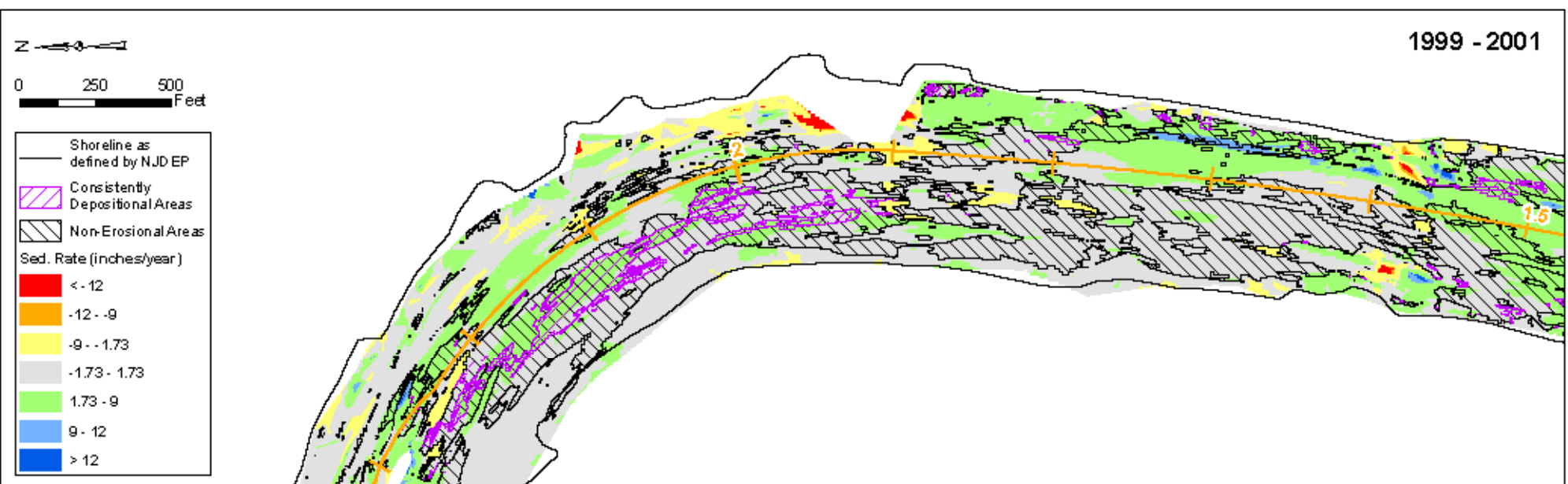
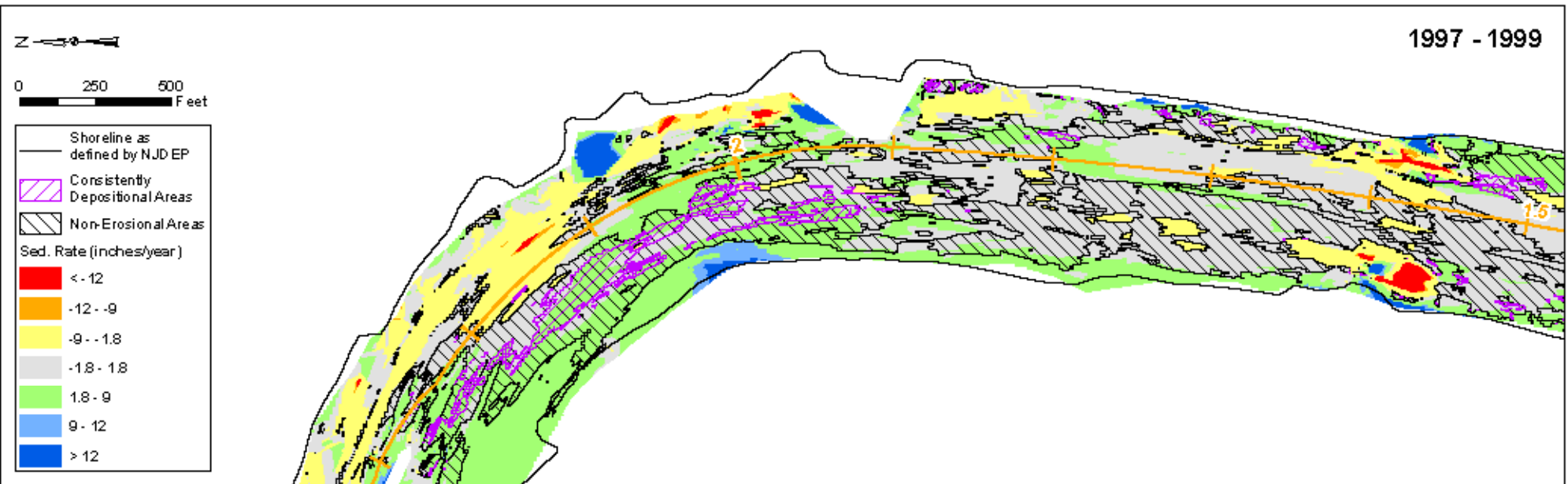
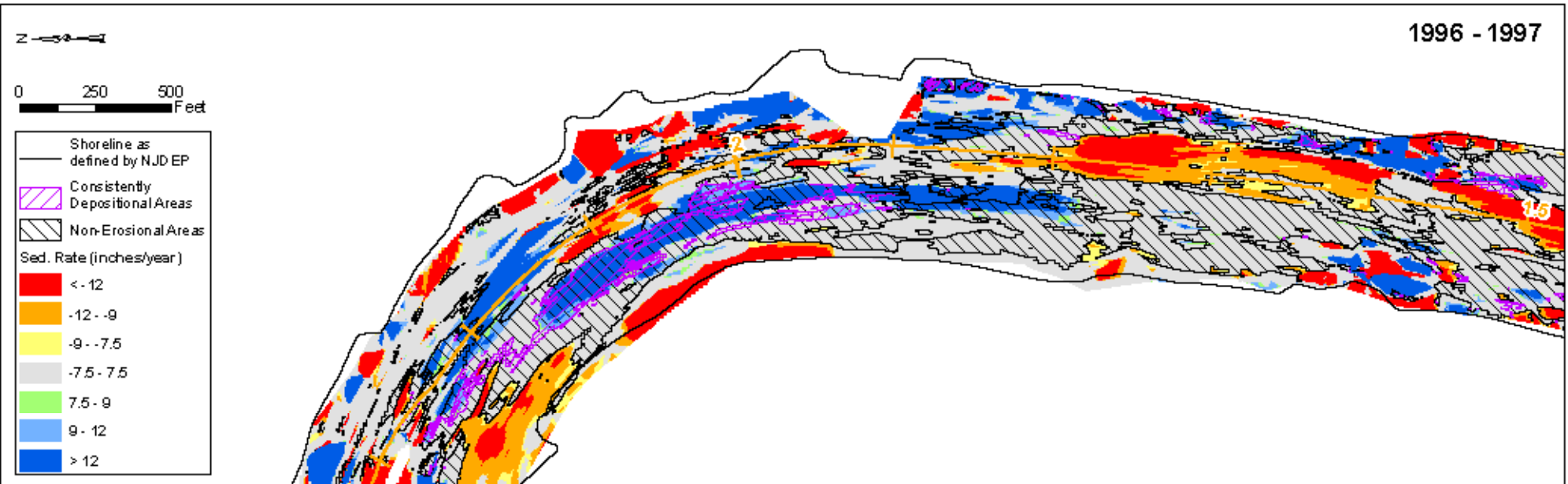
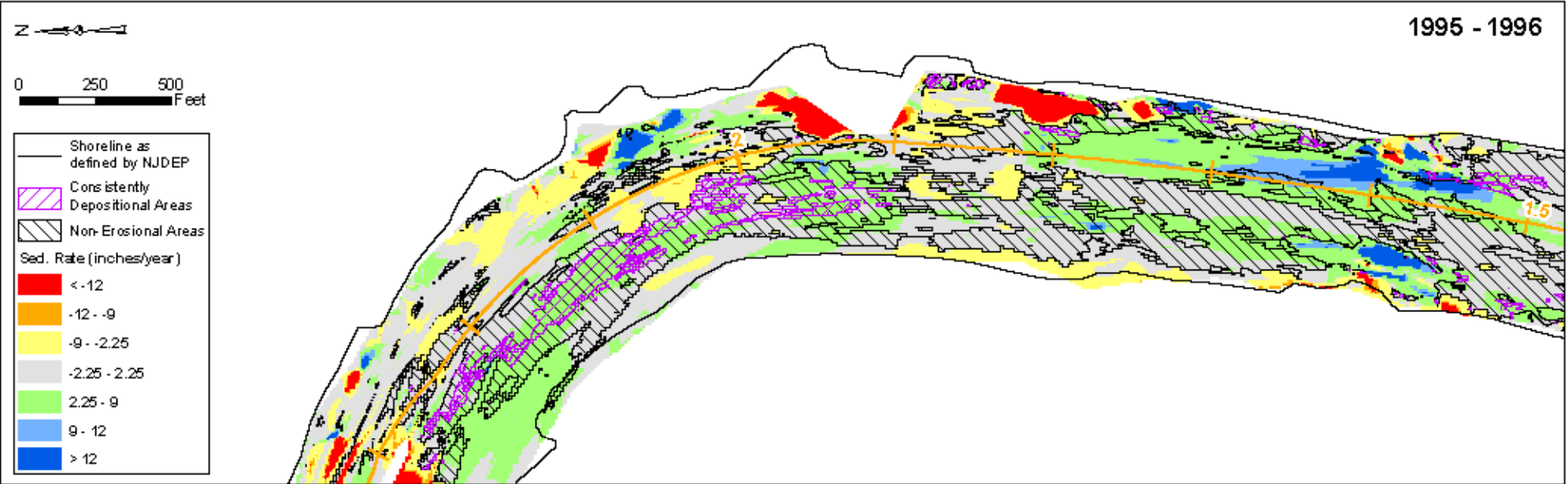


Figure 11-8b



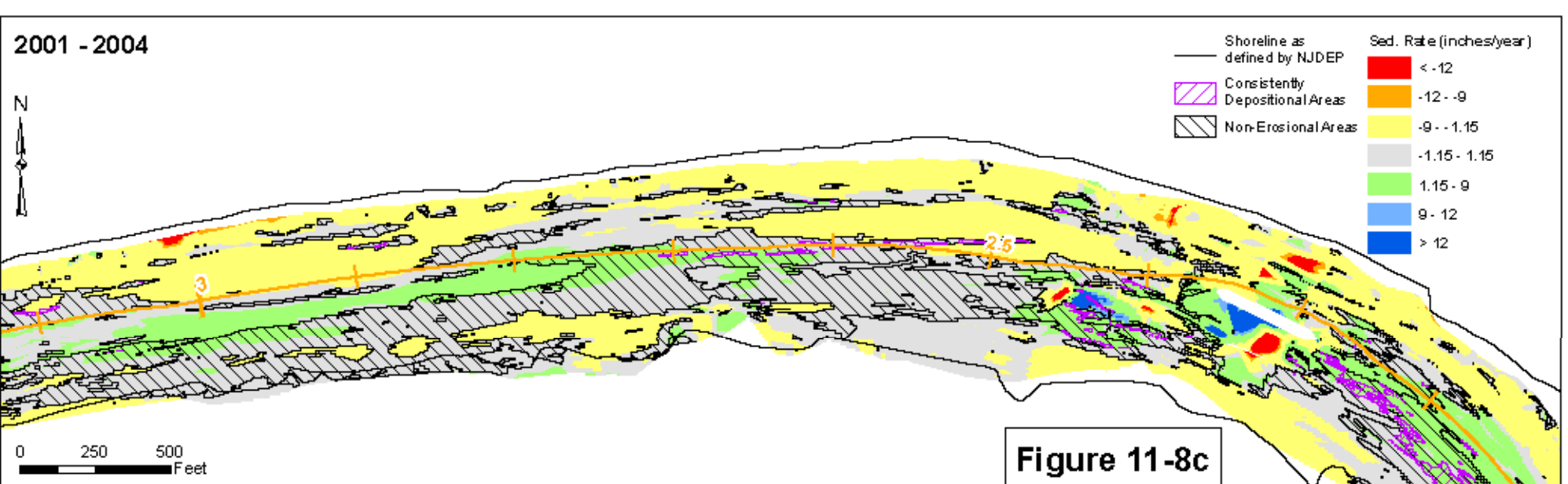
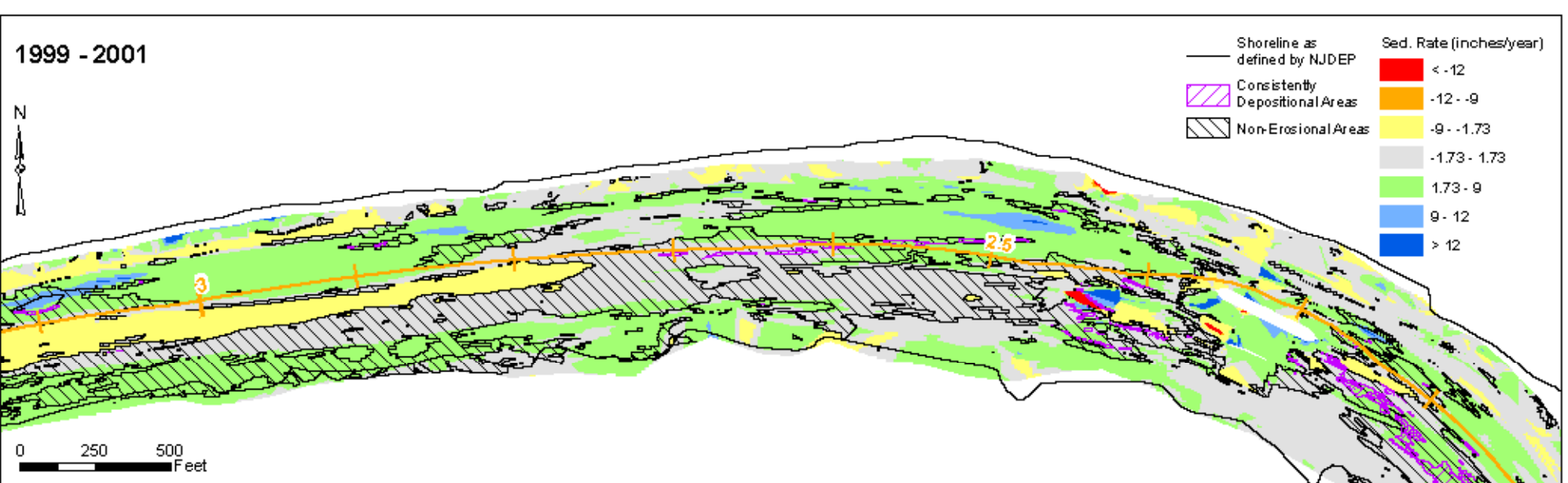
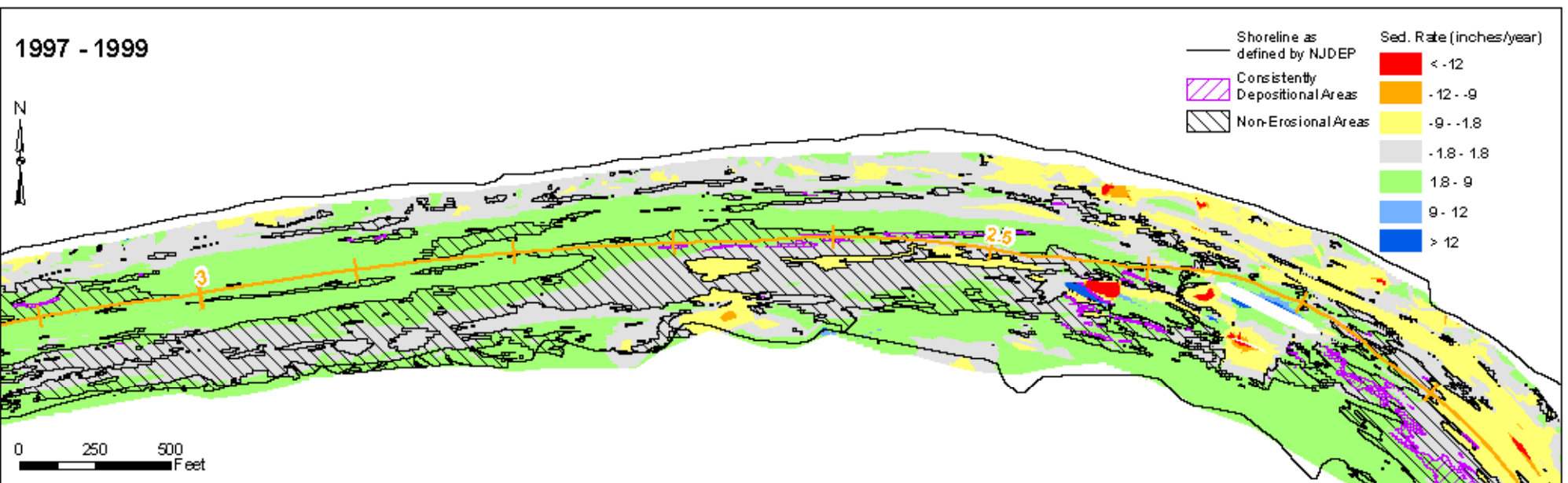
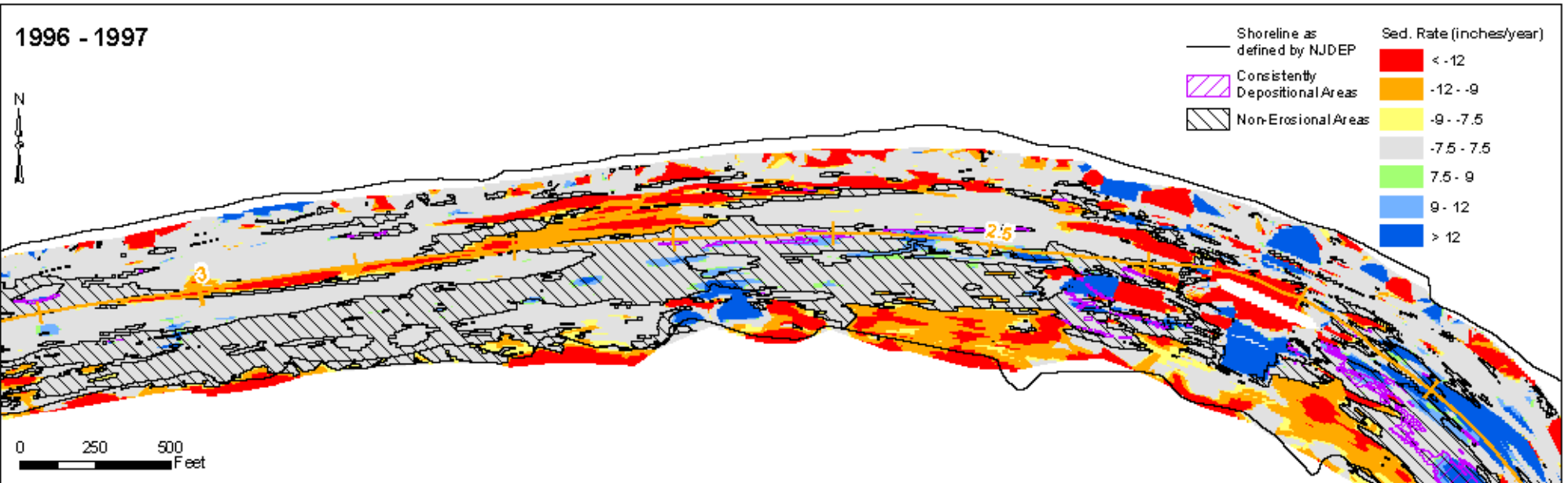
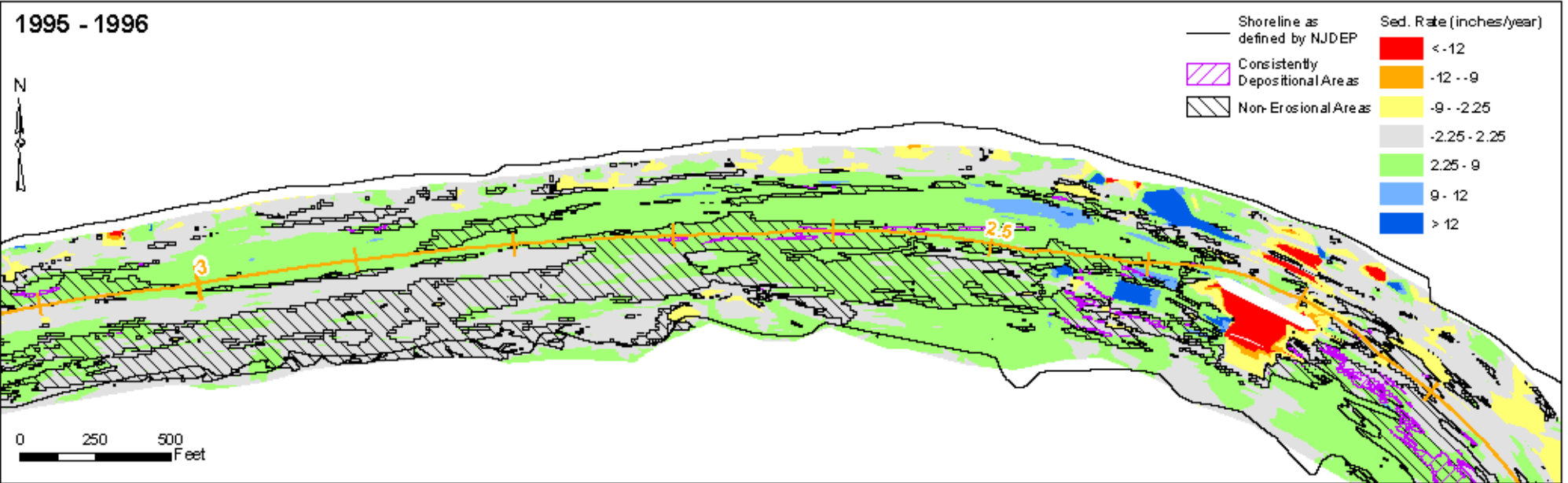


Figure 11-8c



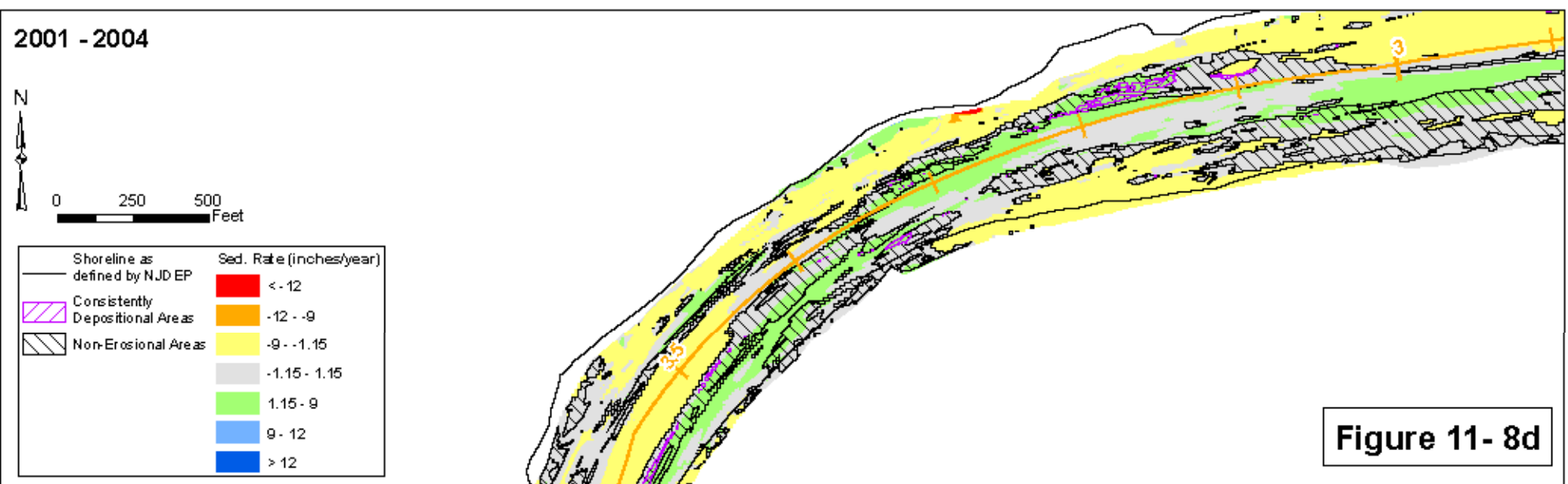
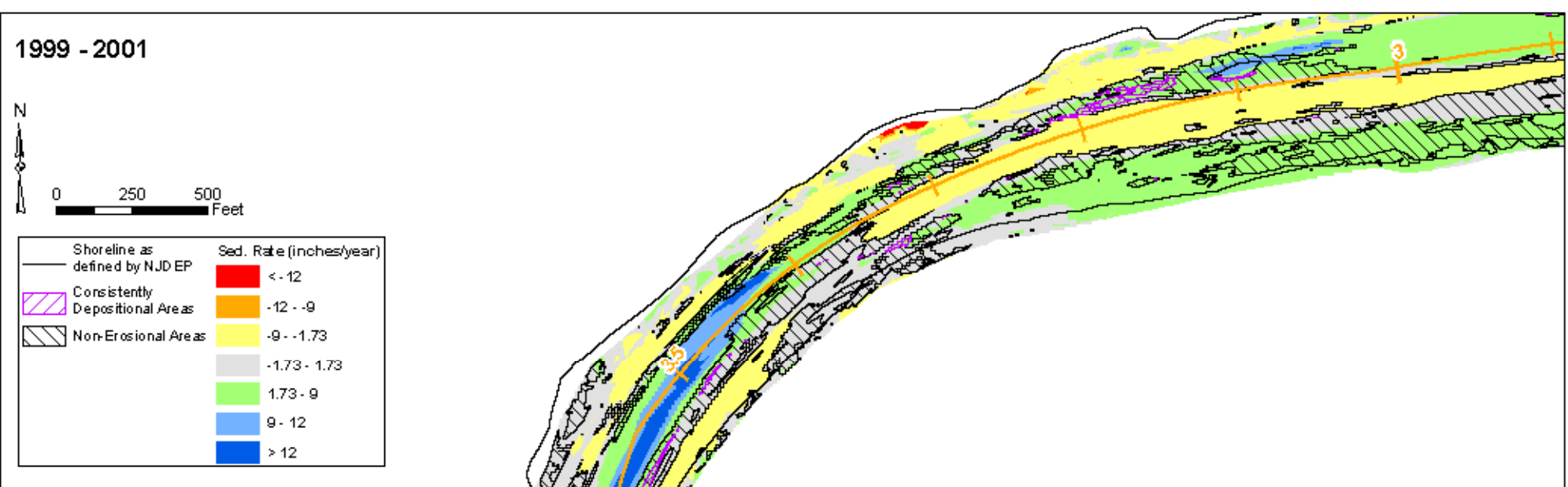
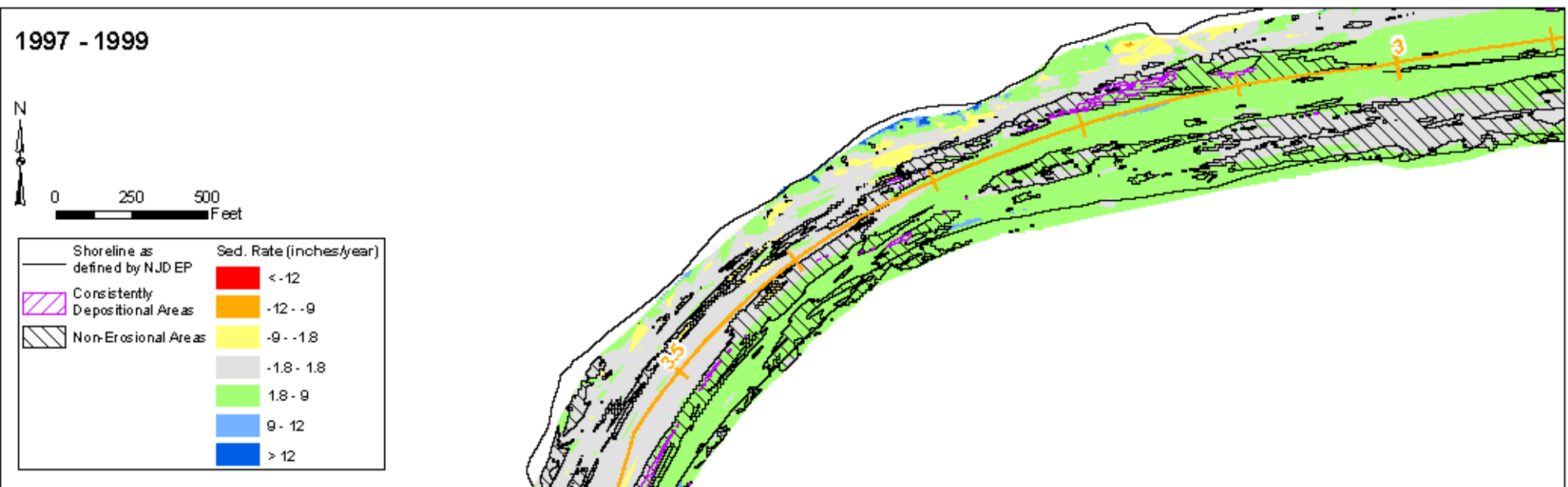
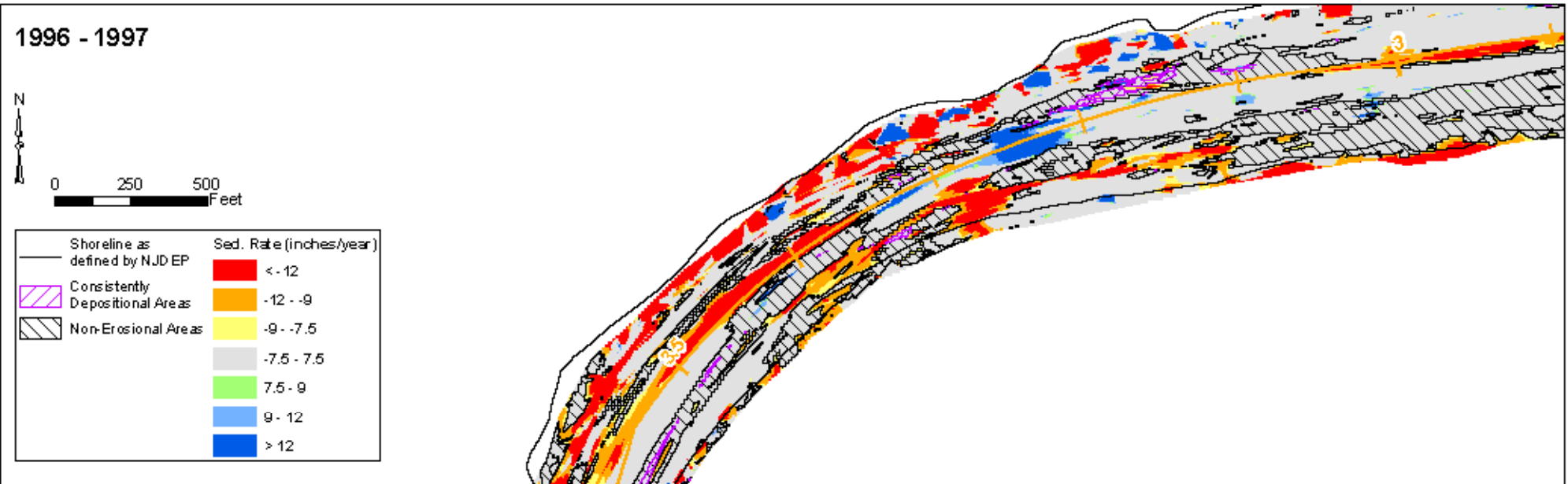
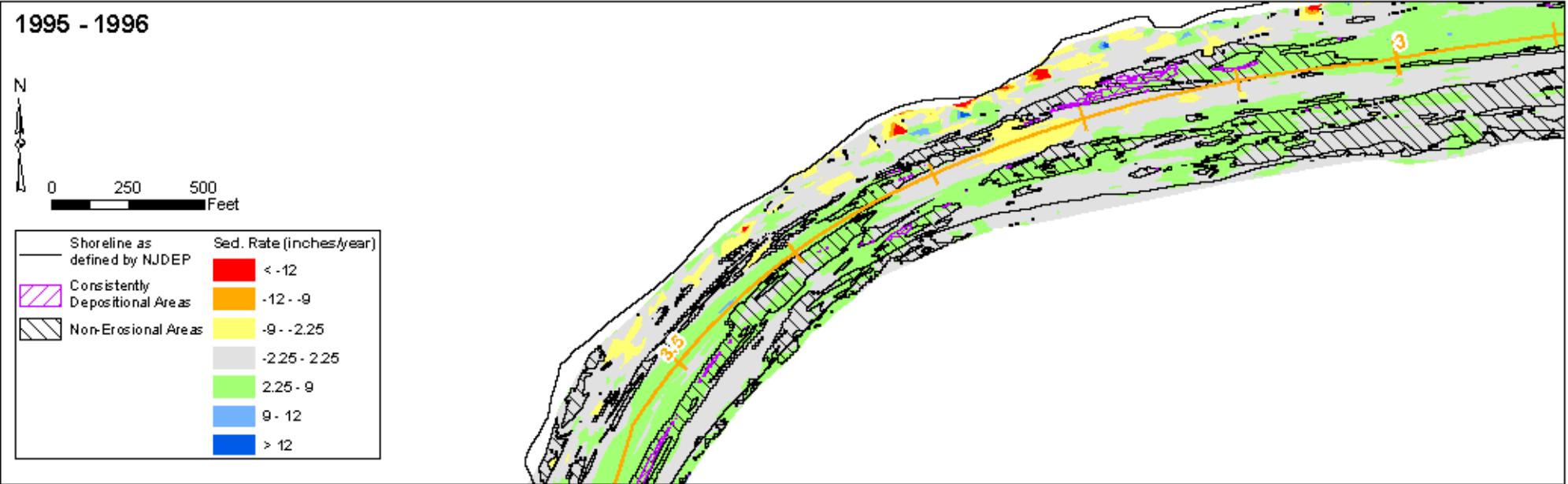


Figure 11- 8d

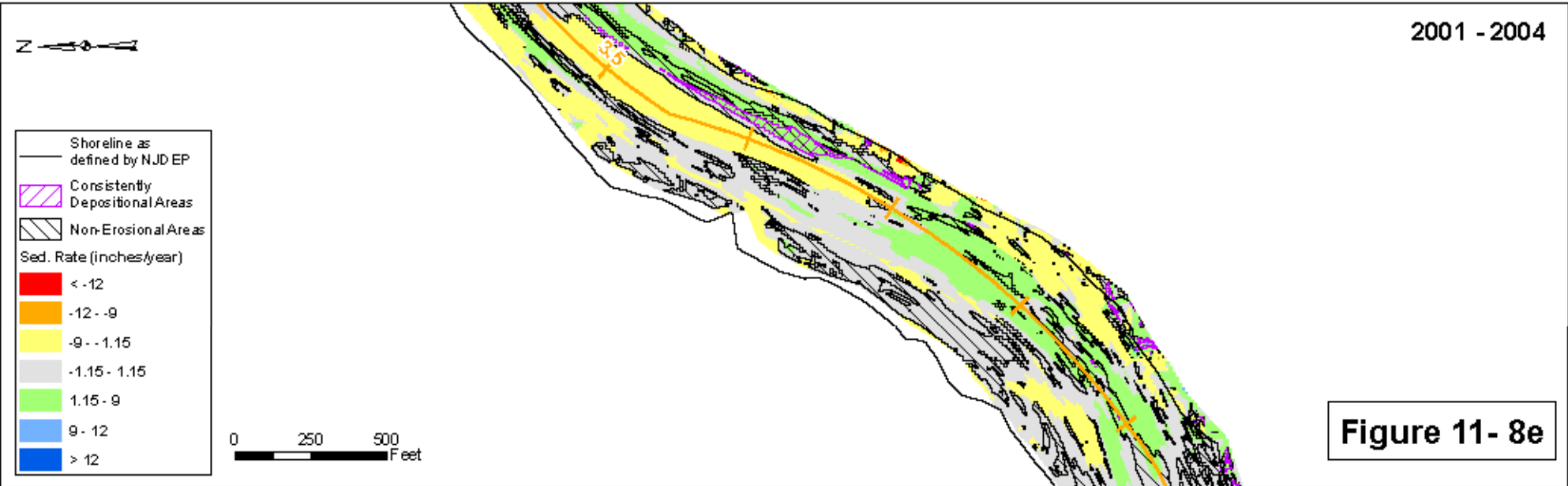
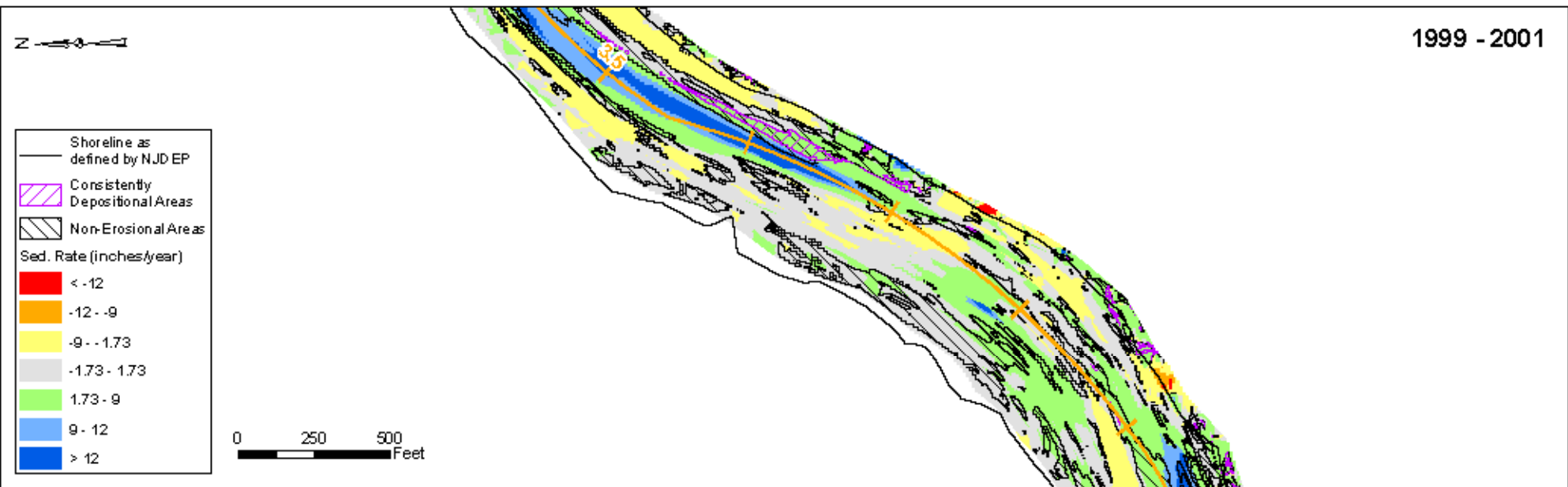
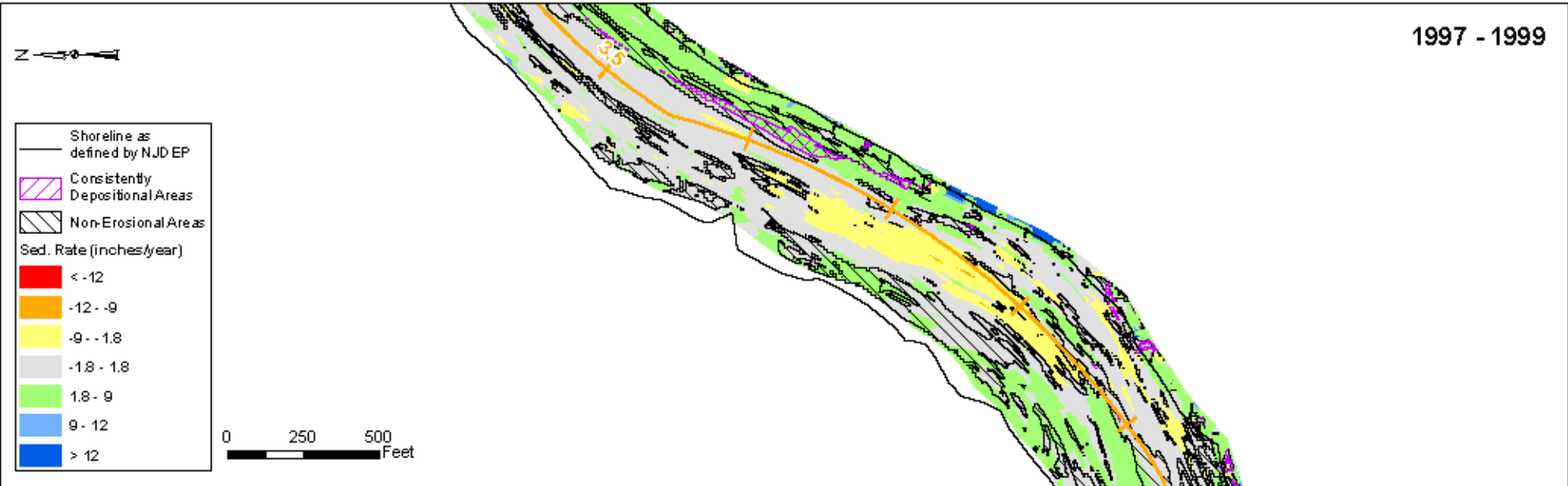
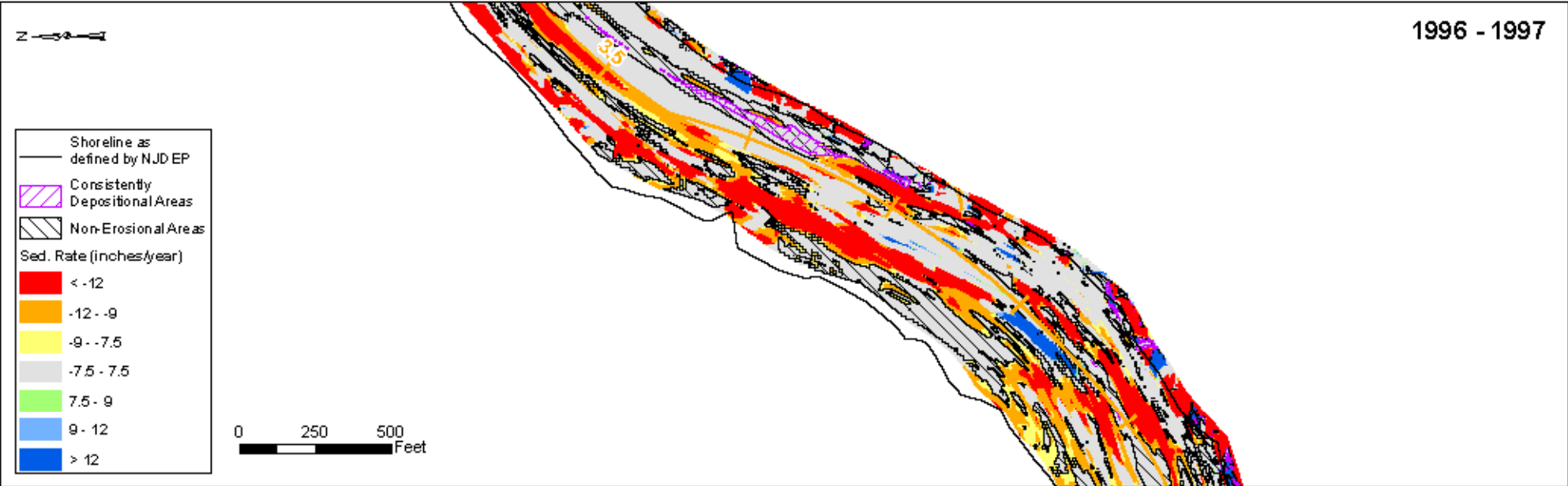
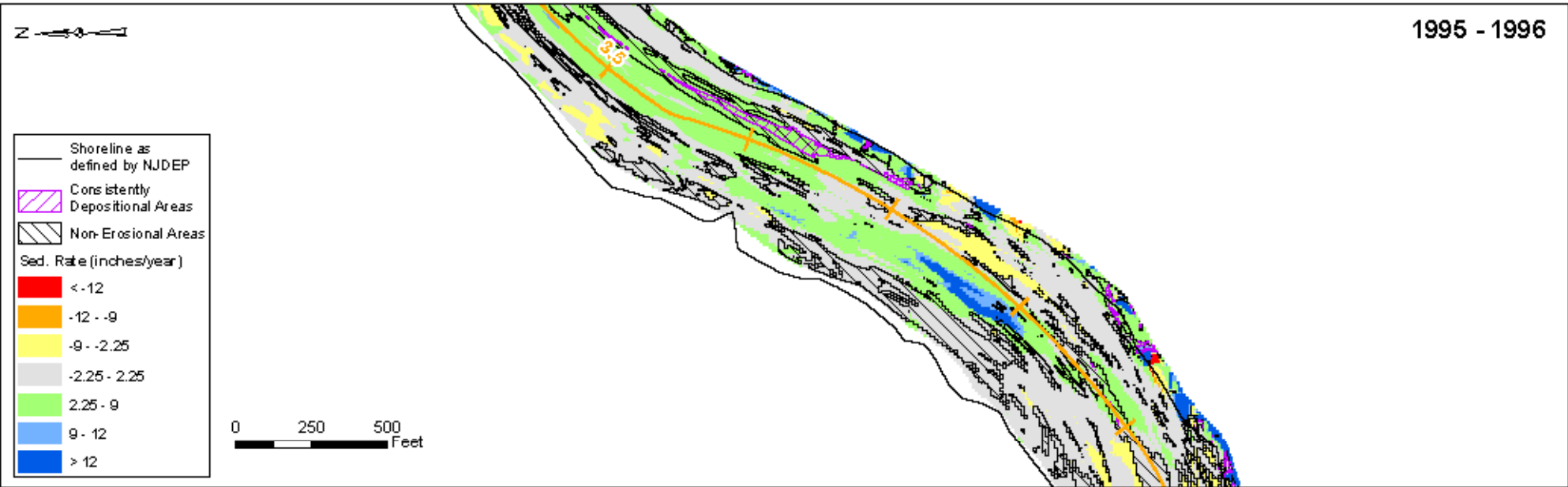


Figure 11- 8e



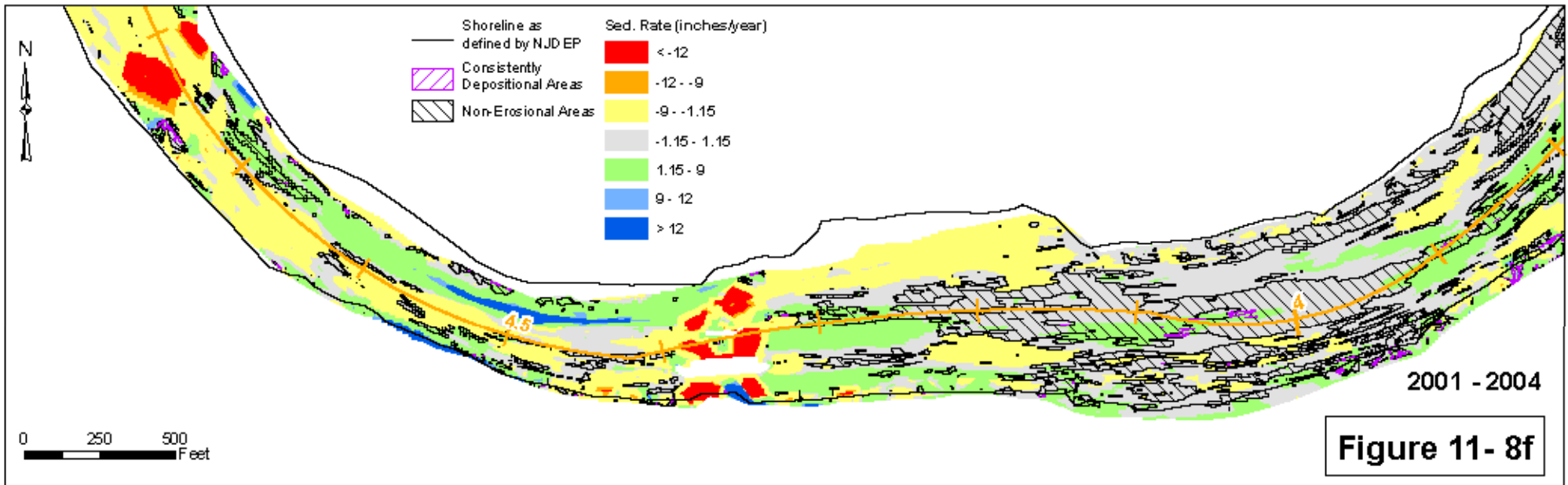
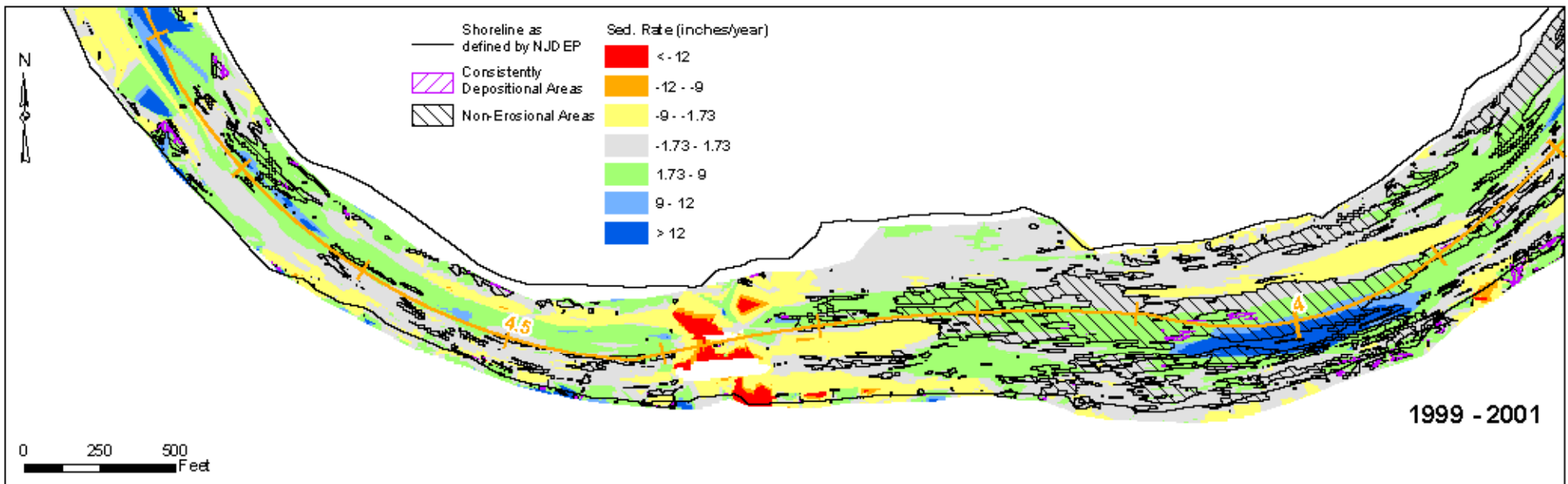
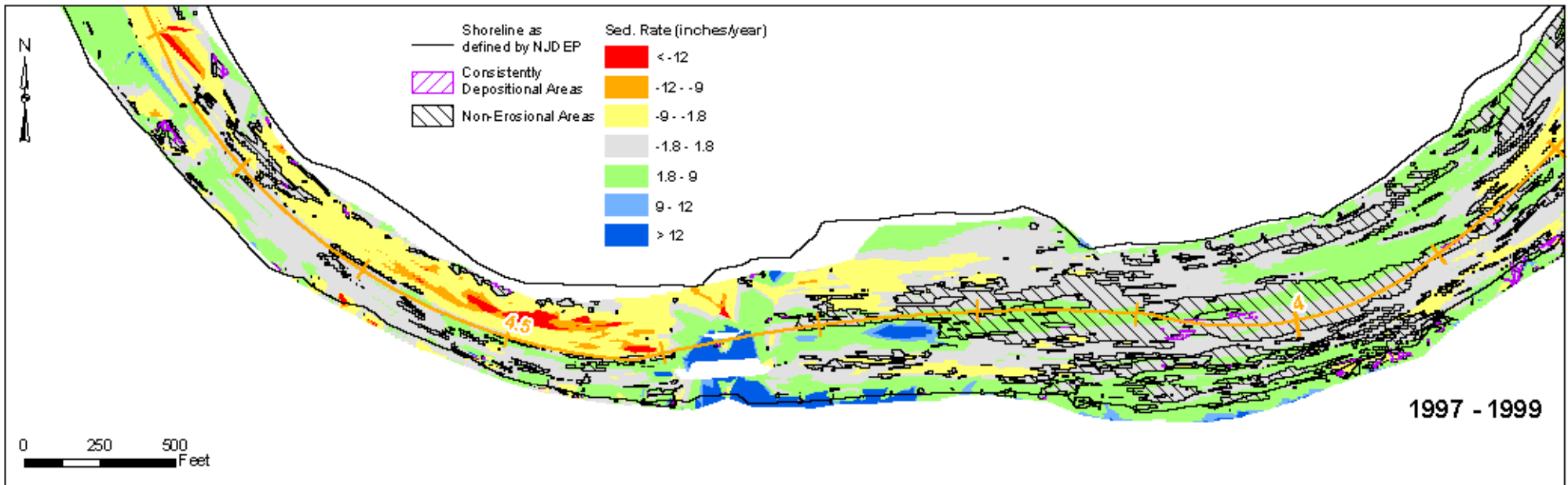
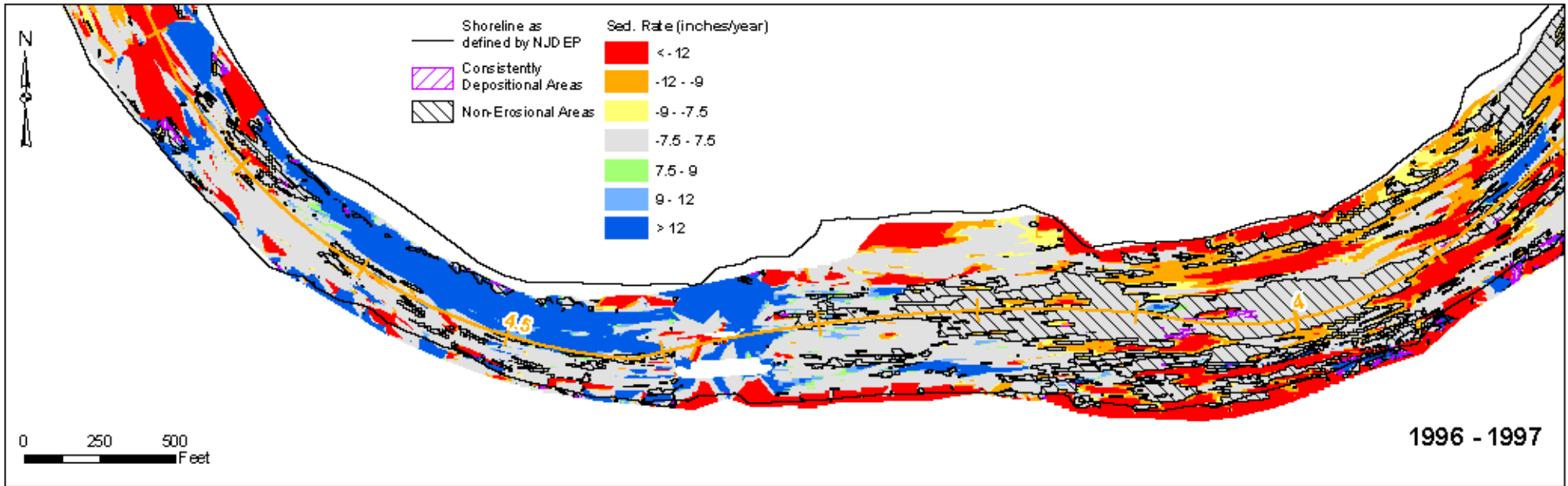
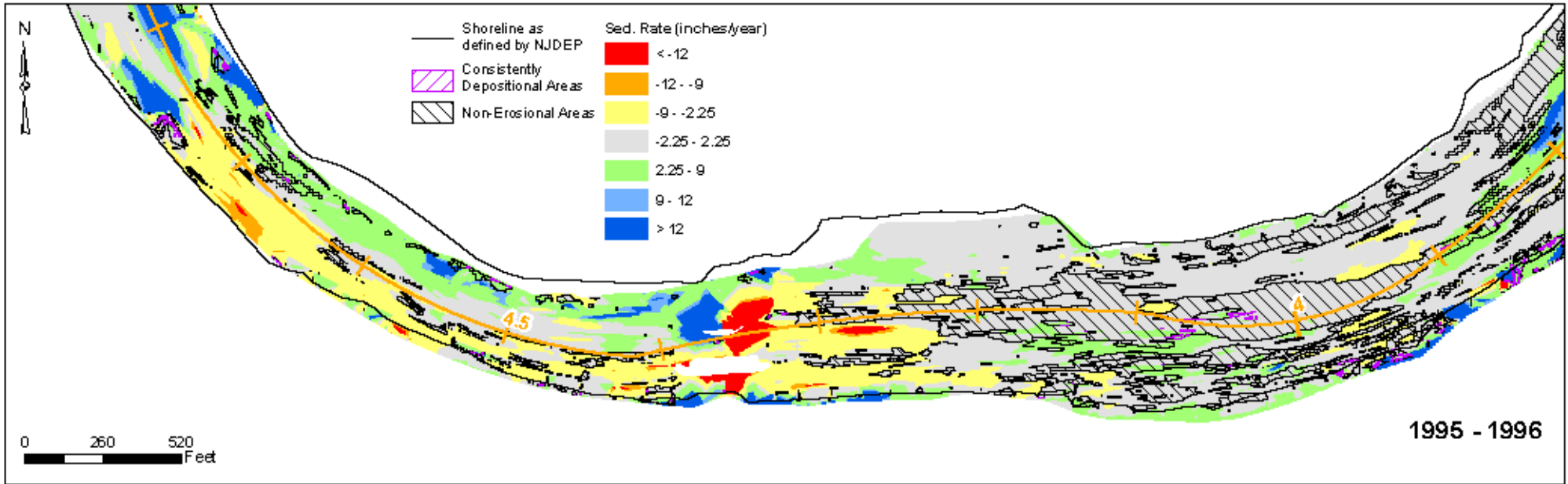
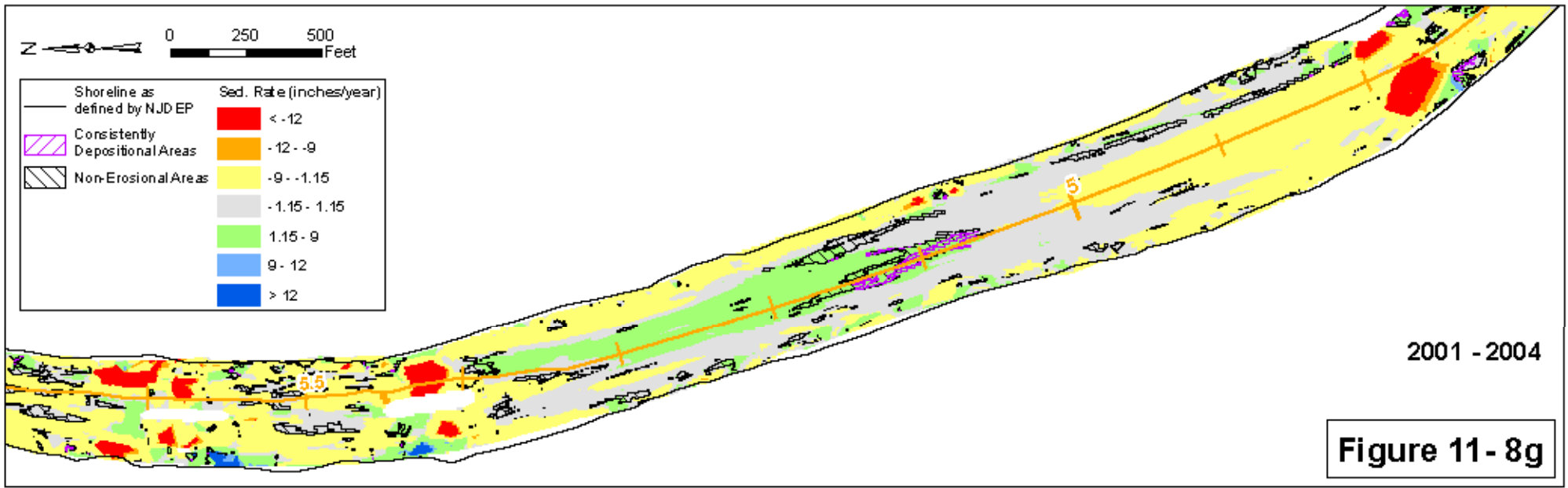
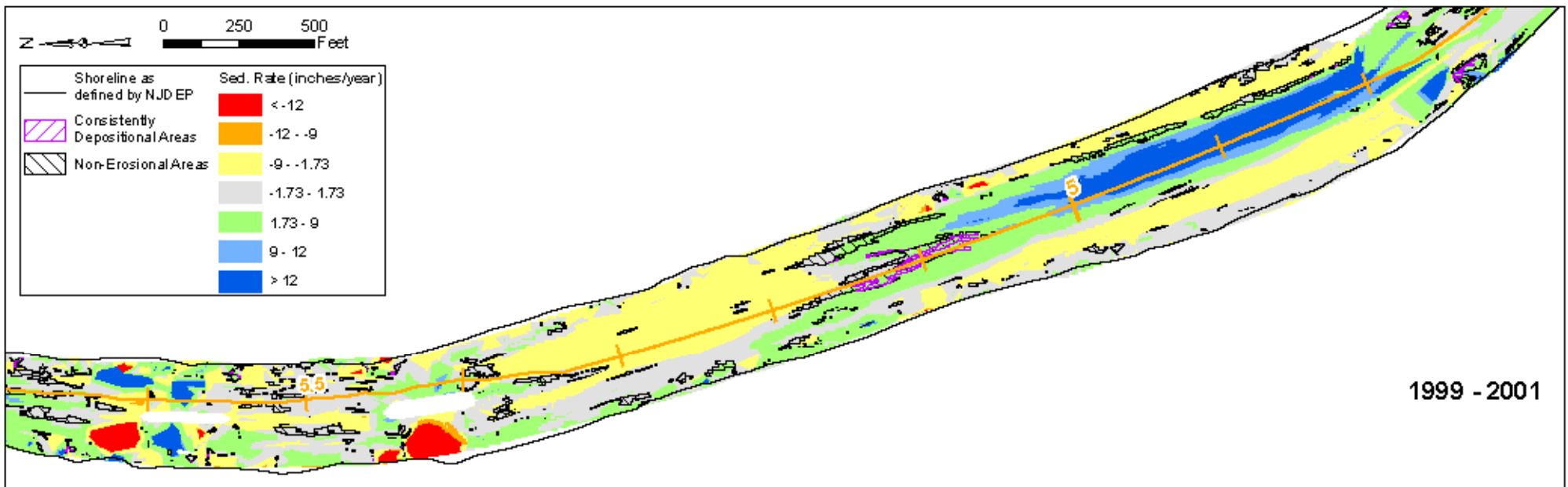
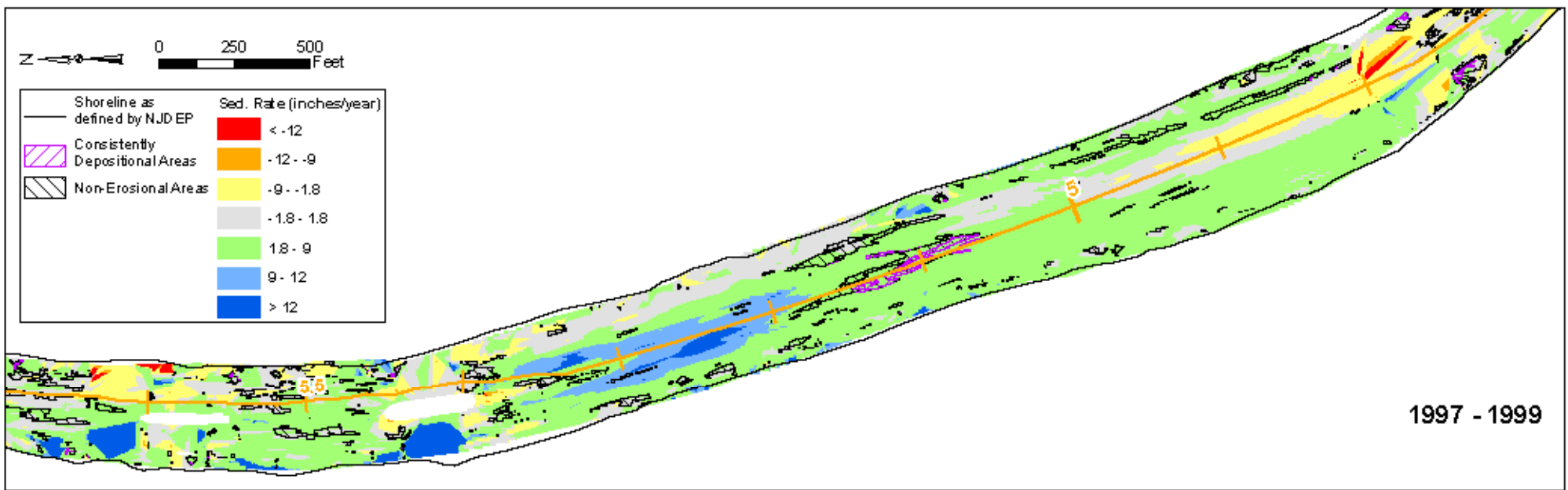
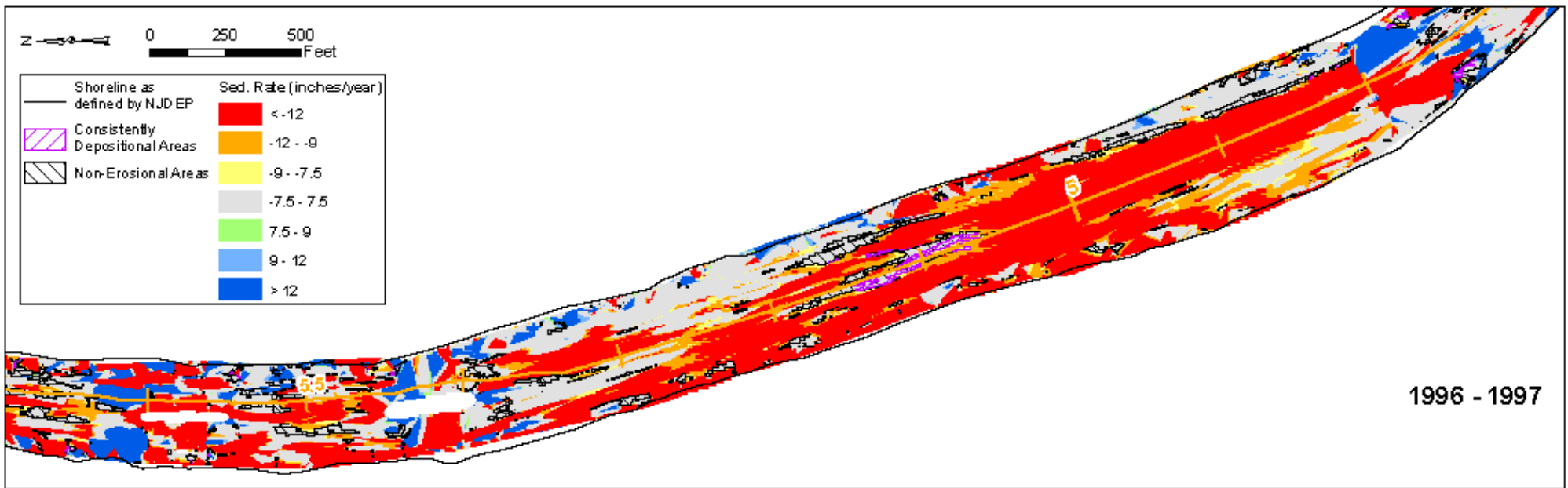
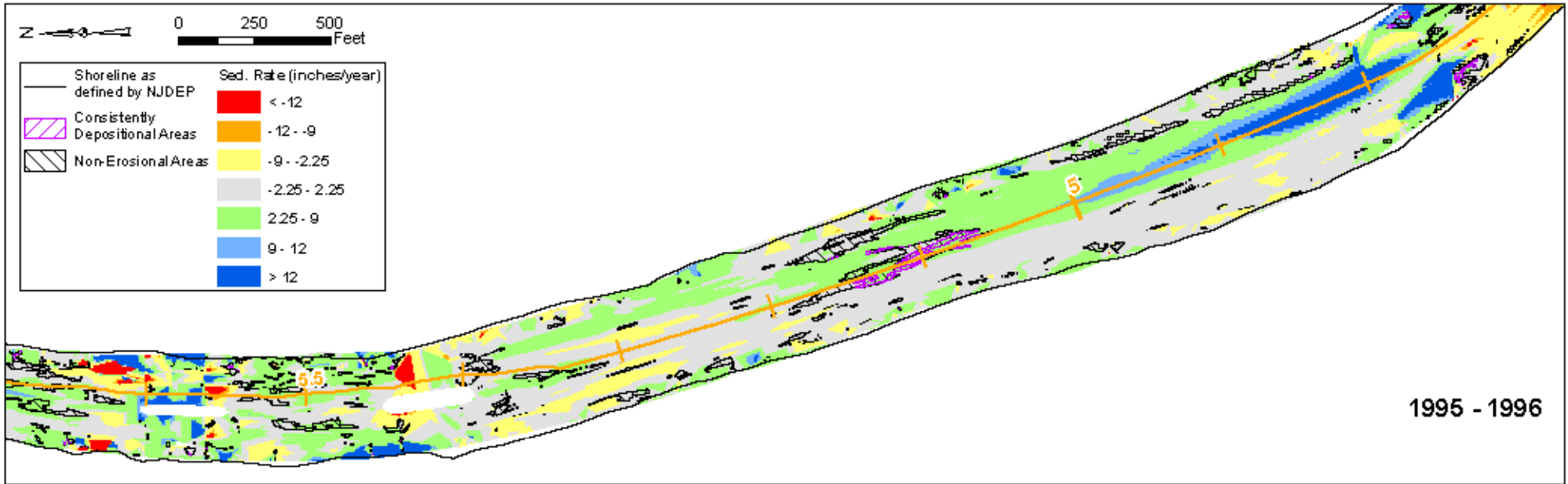


Figure 11- 8f





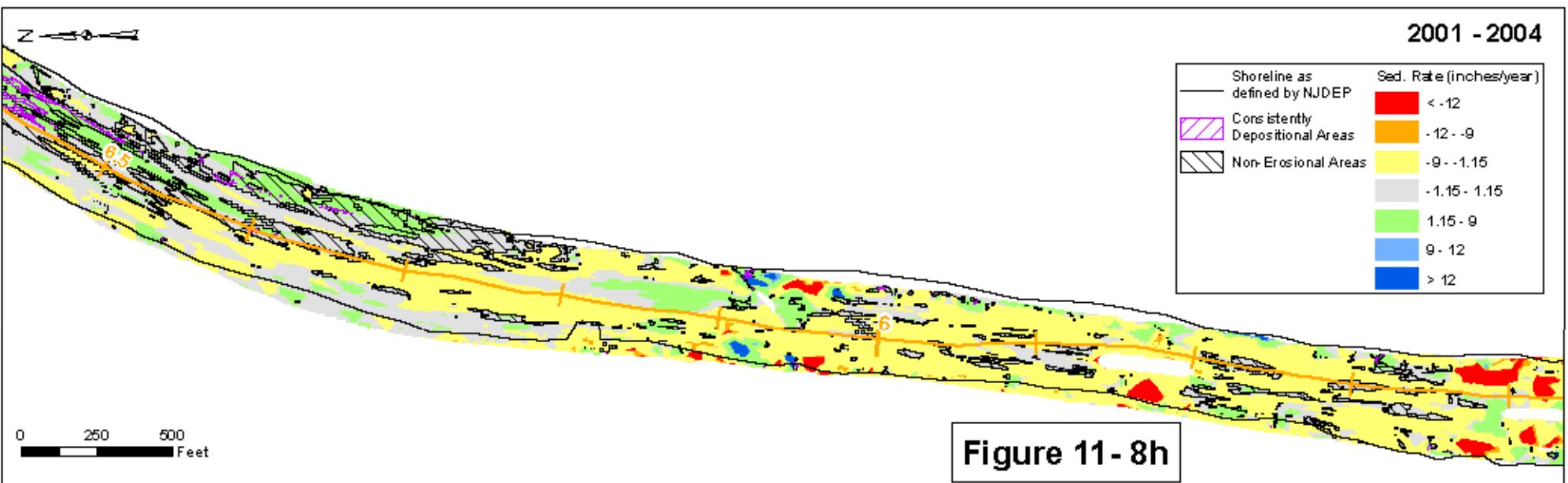
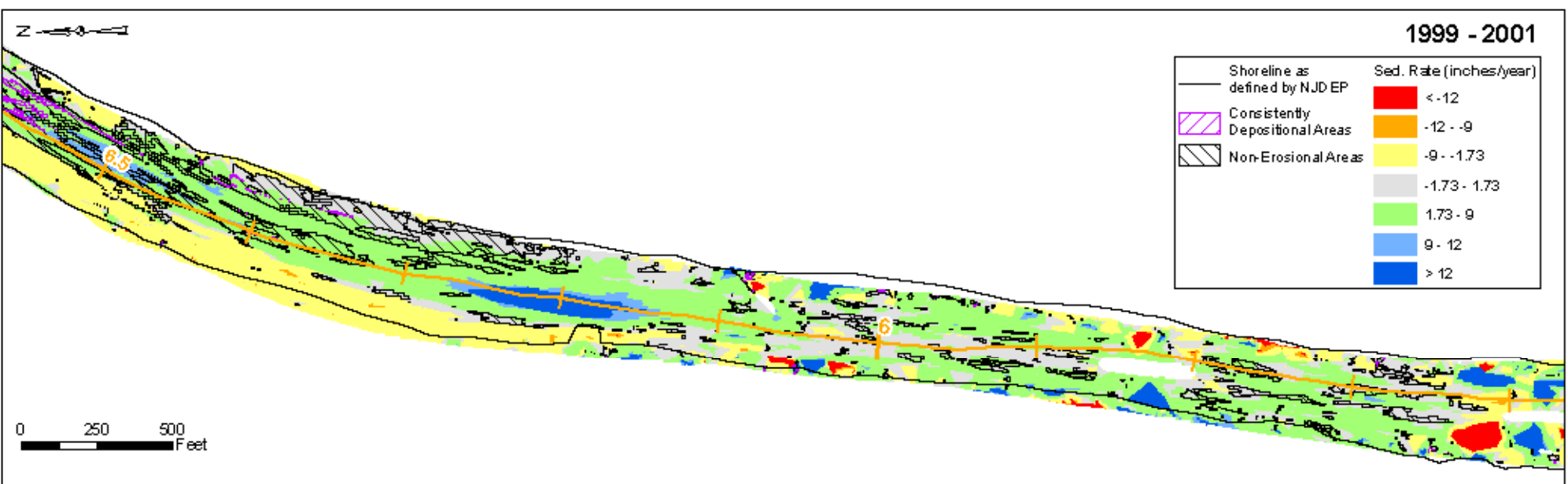
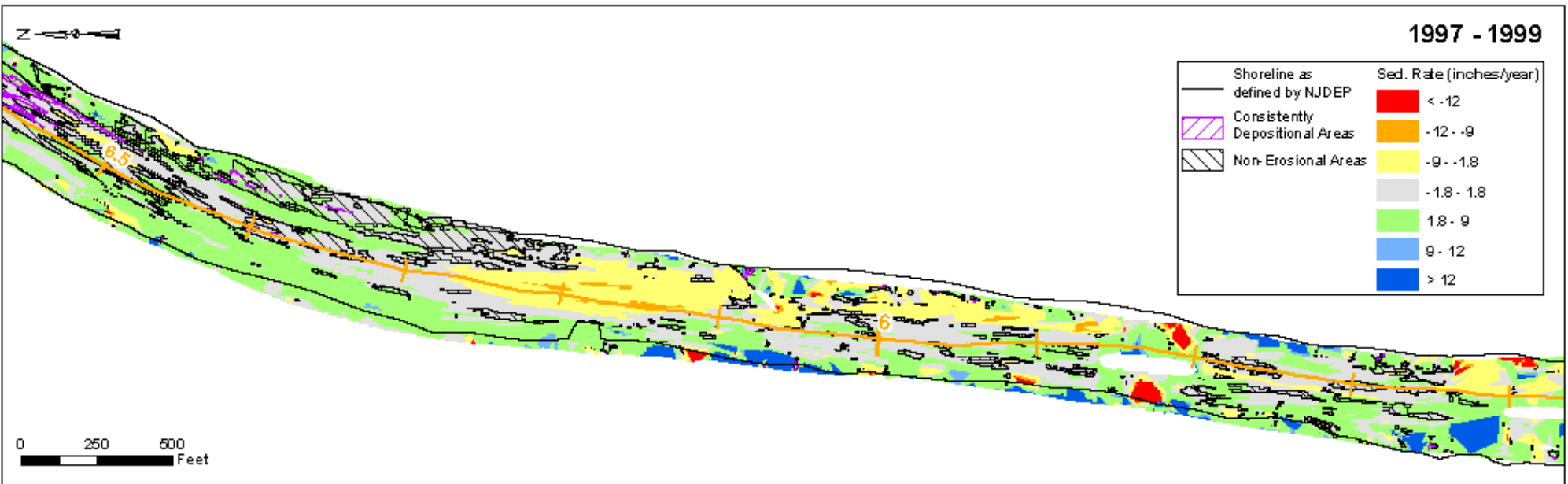
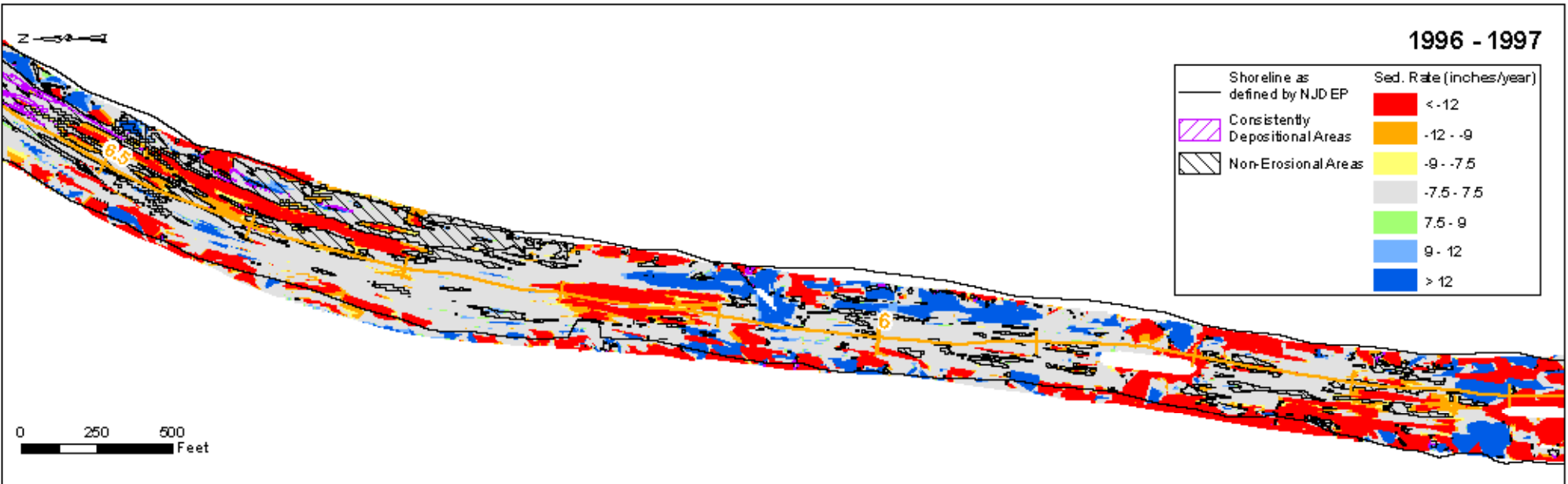
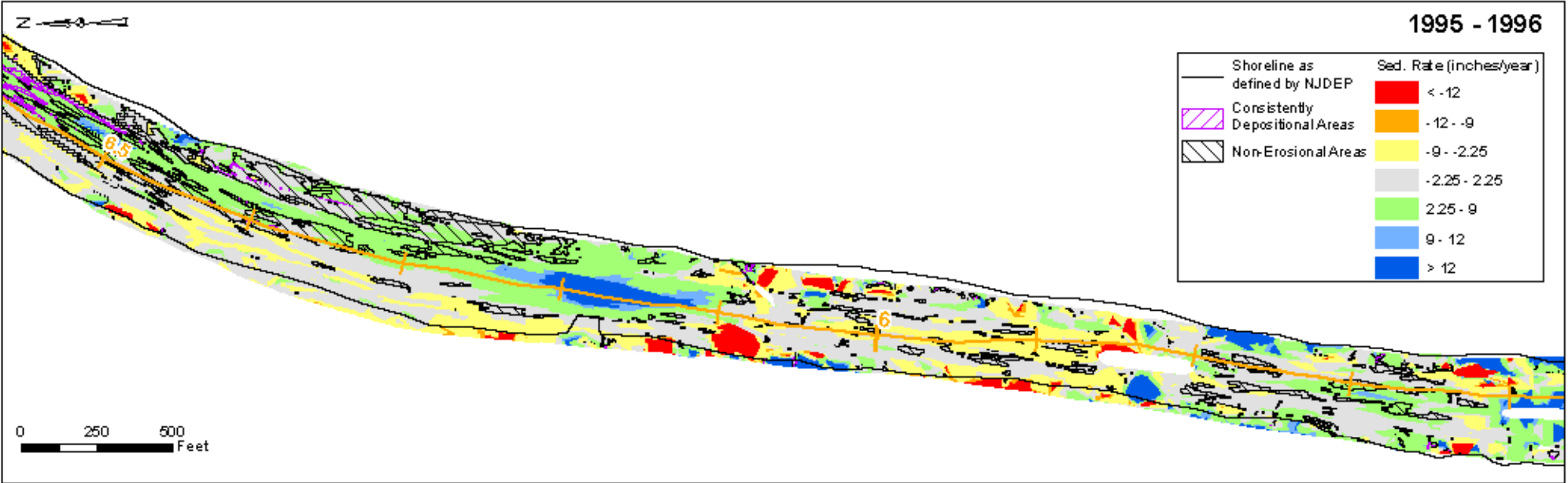


Figure 11- 8h



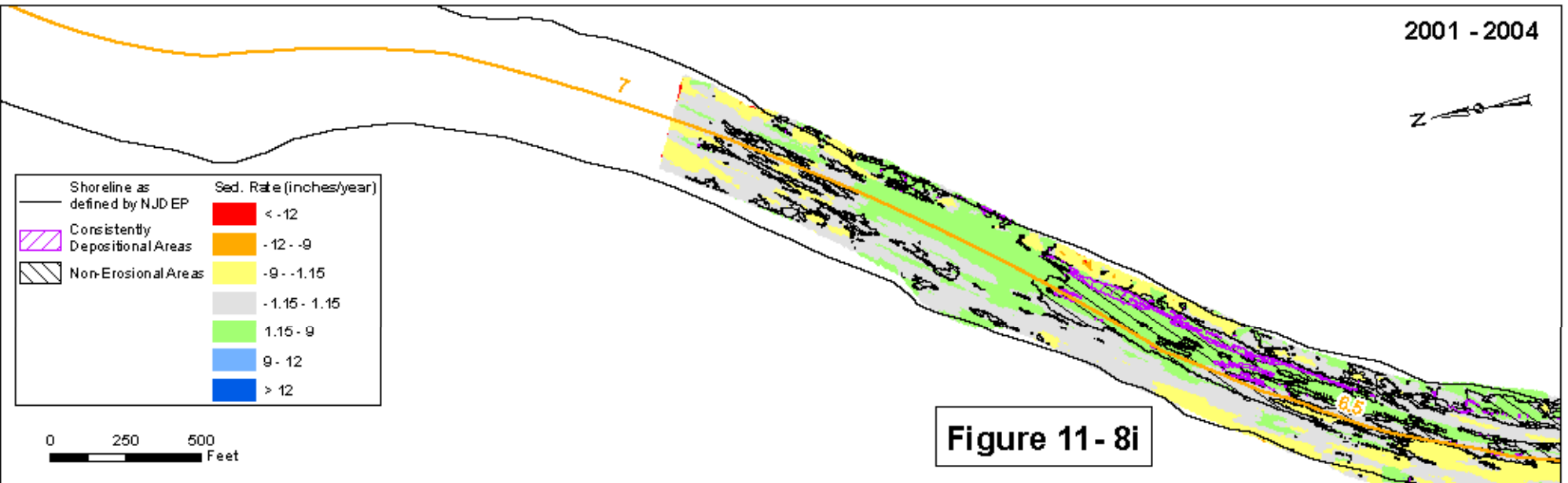
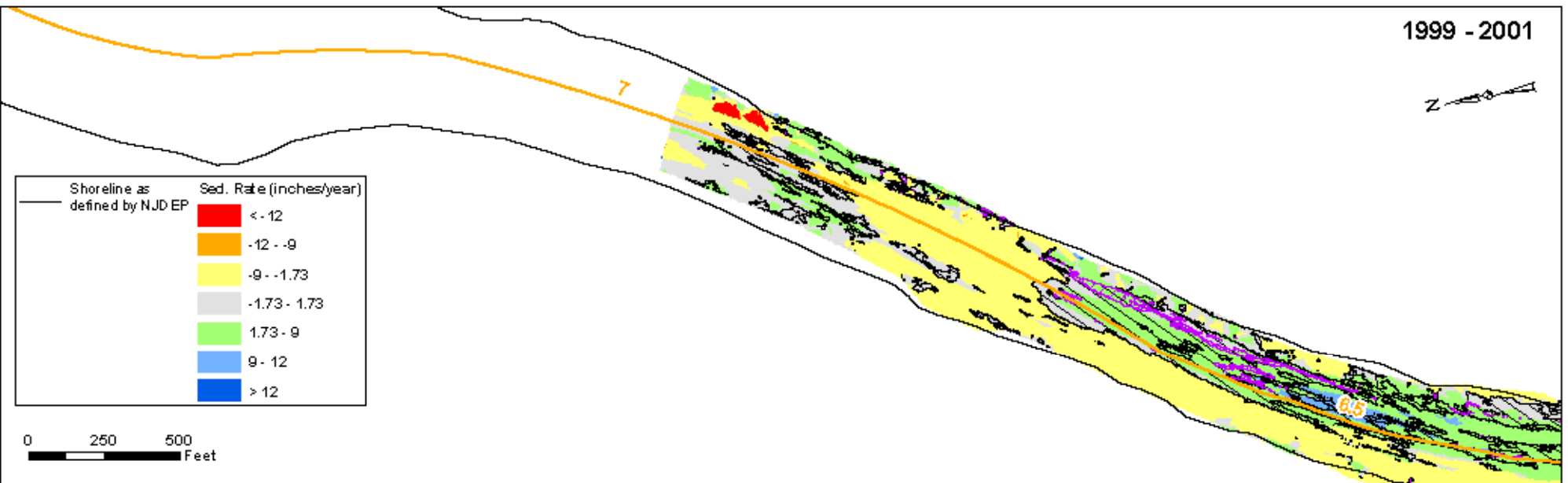
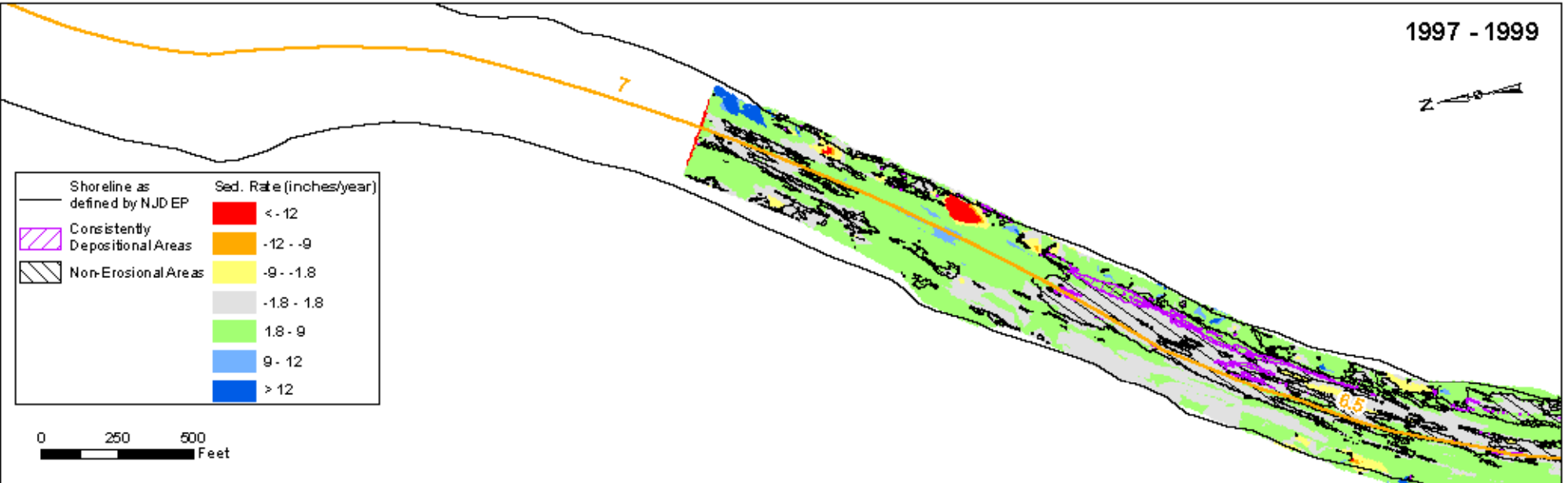
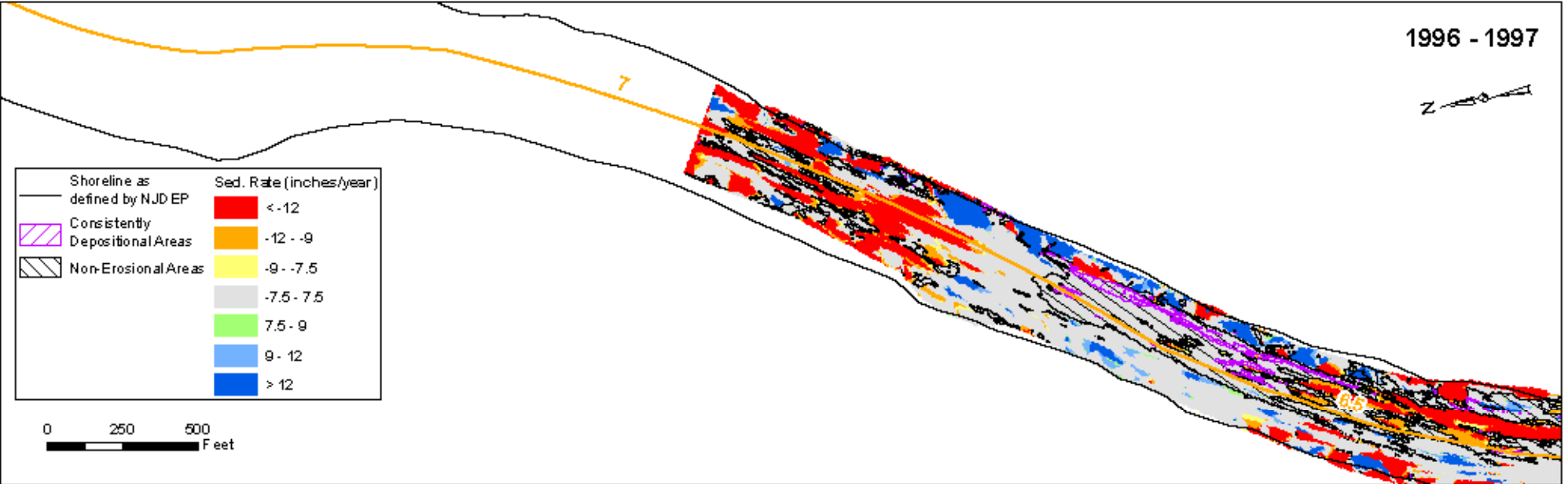
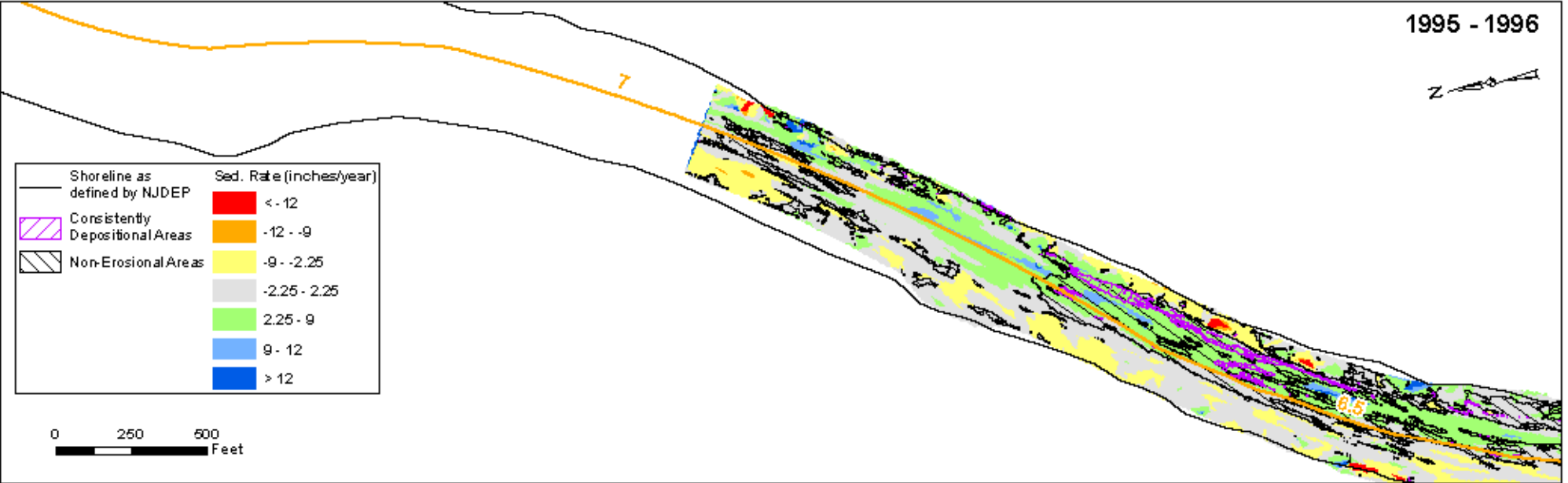
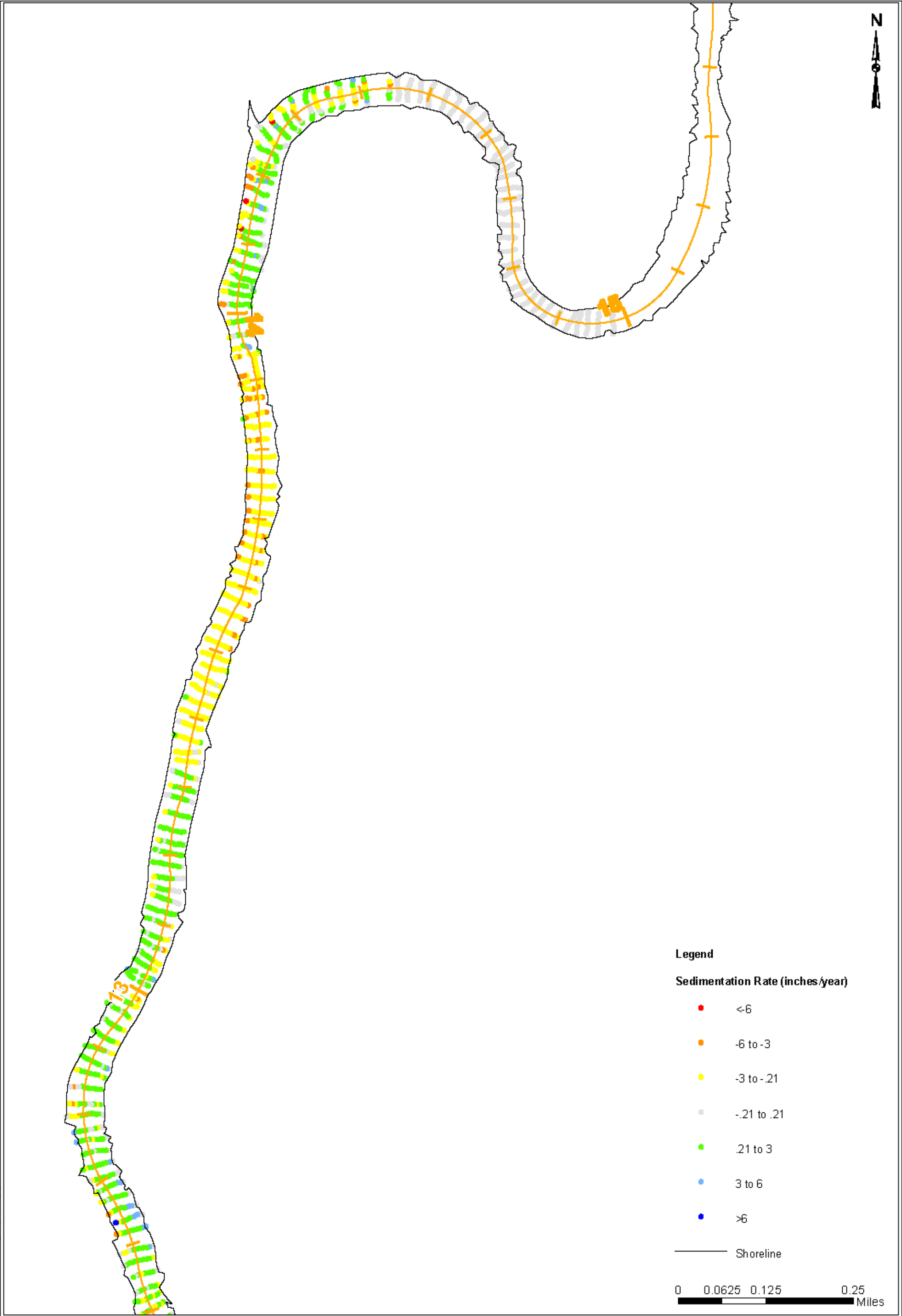


Figure 11- 8i

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# Net Sedimentation Rate 1989-2007

Lower Passaic River Restoration Project

Figure 11 - 9a

2009



**Legend**

**Sedimentation Rate (inches/year)**

- <-6
- -6 to -3
- -3 to -.21
- -.21 to .21
- .21 to 3
- 3 to 6
- >6

— Shoreline

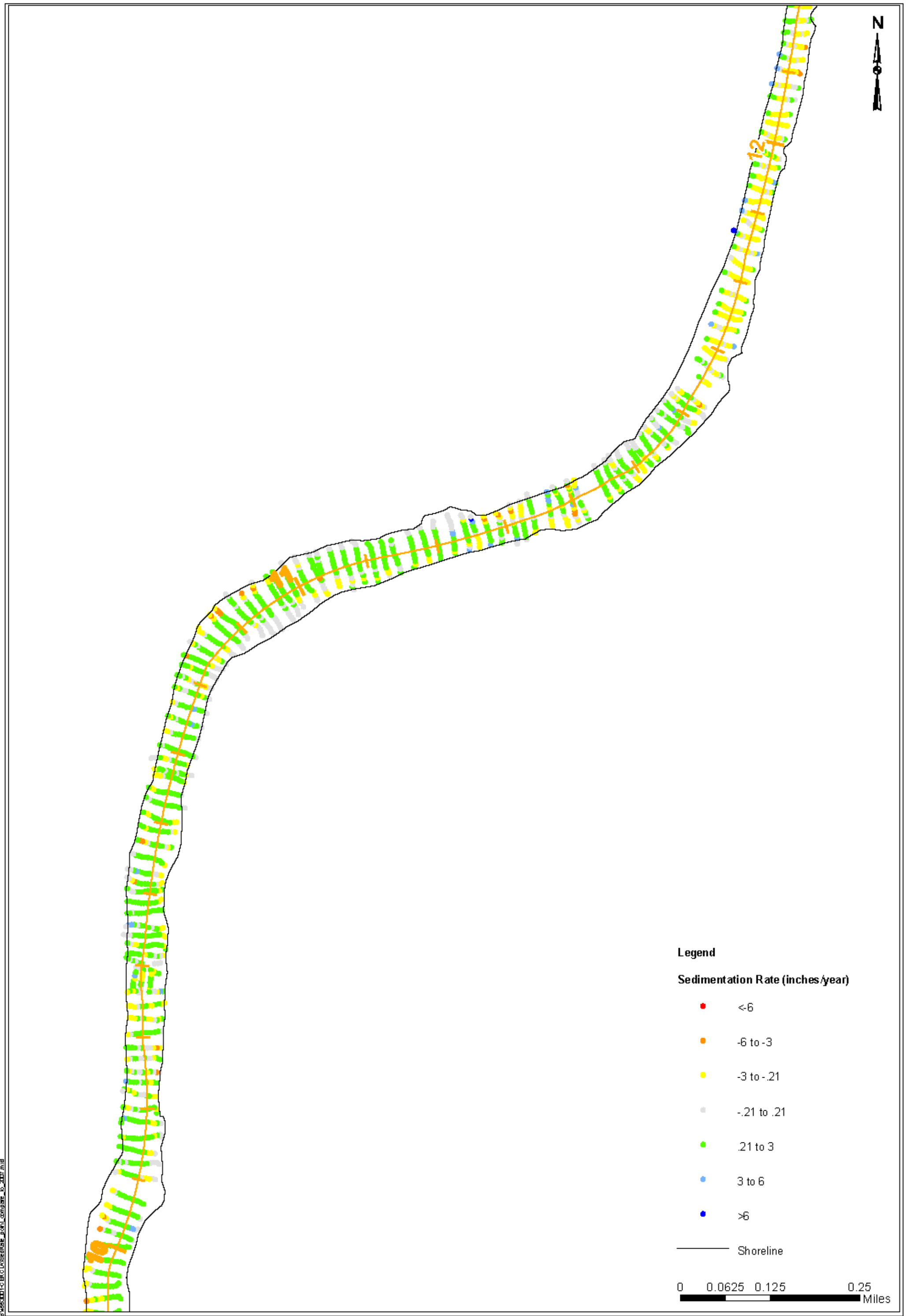
0    0.0625    0.125    0.25  
Miles

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**Net Sedimentation Rate 1989-2007**

*Lower Passaic River Restoration Project*



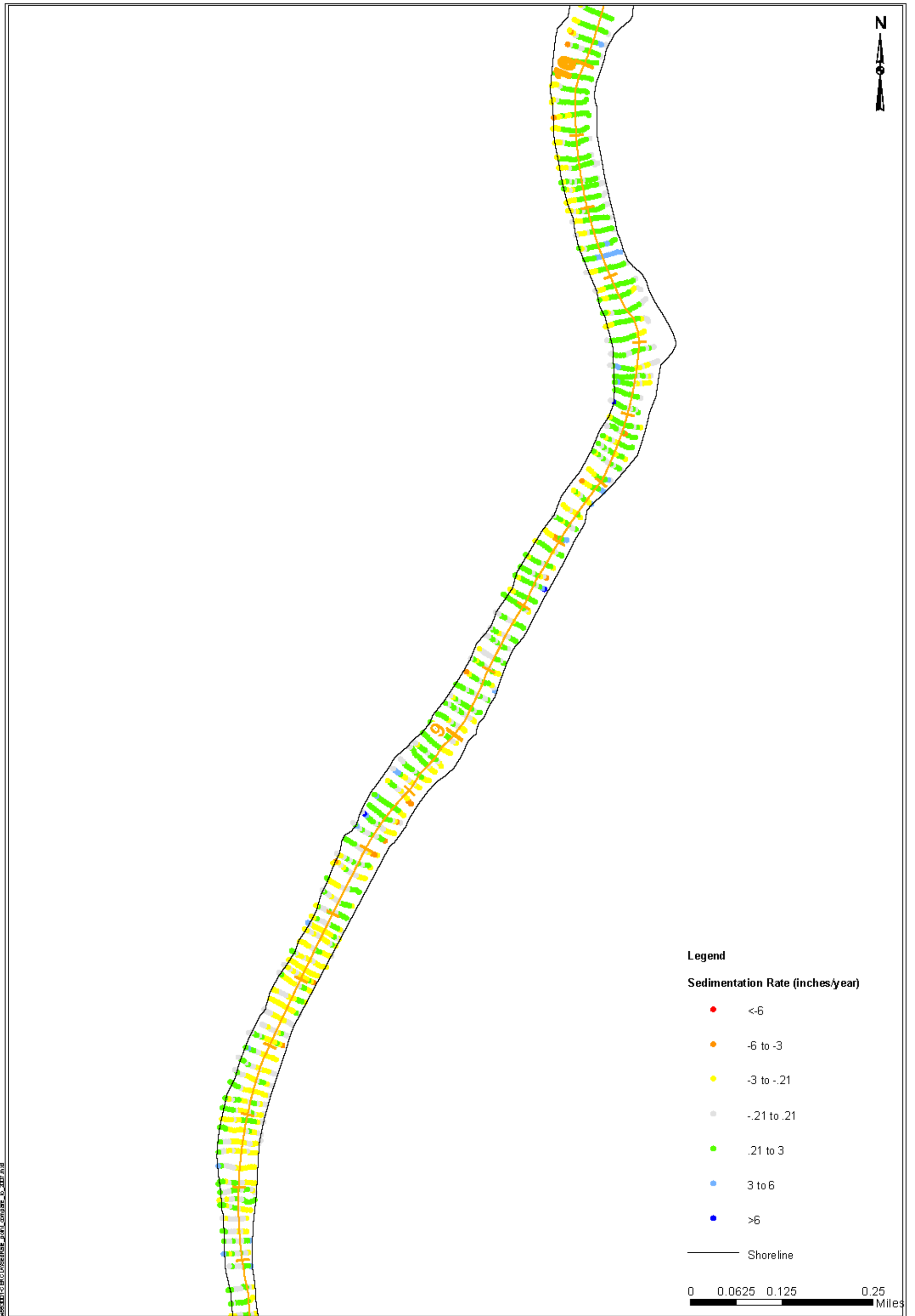
Net Sedimentation Rate 1989-2007

Lower Passaic River Restoration Project

Figure 11 - 9c

2009

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Net Sedimentation Rate 1989-2007

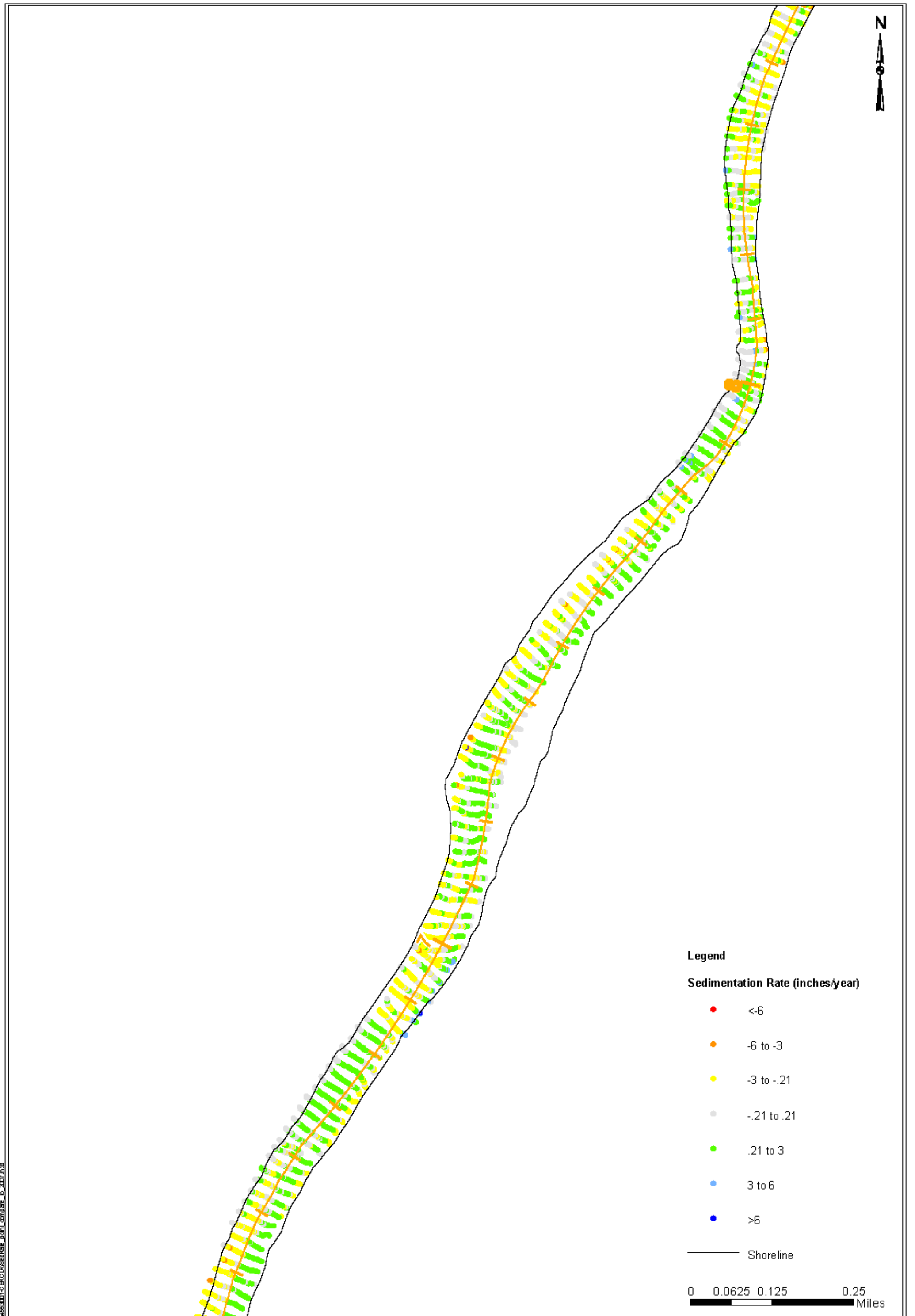
Lower Passaic River Restoration Project

Figure 11 - 9d

2009



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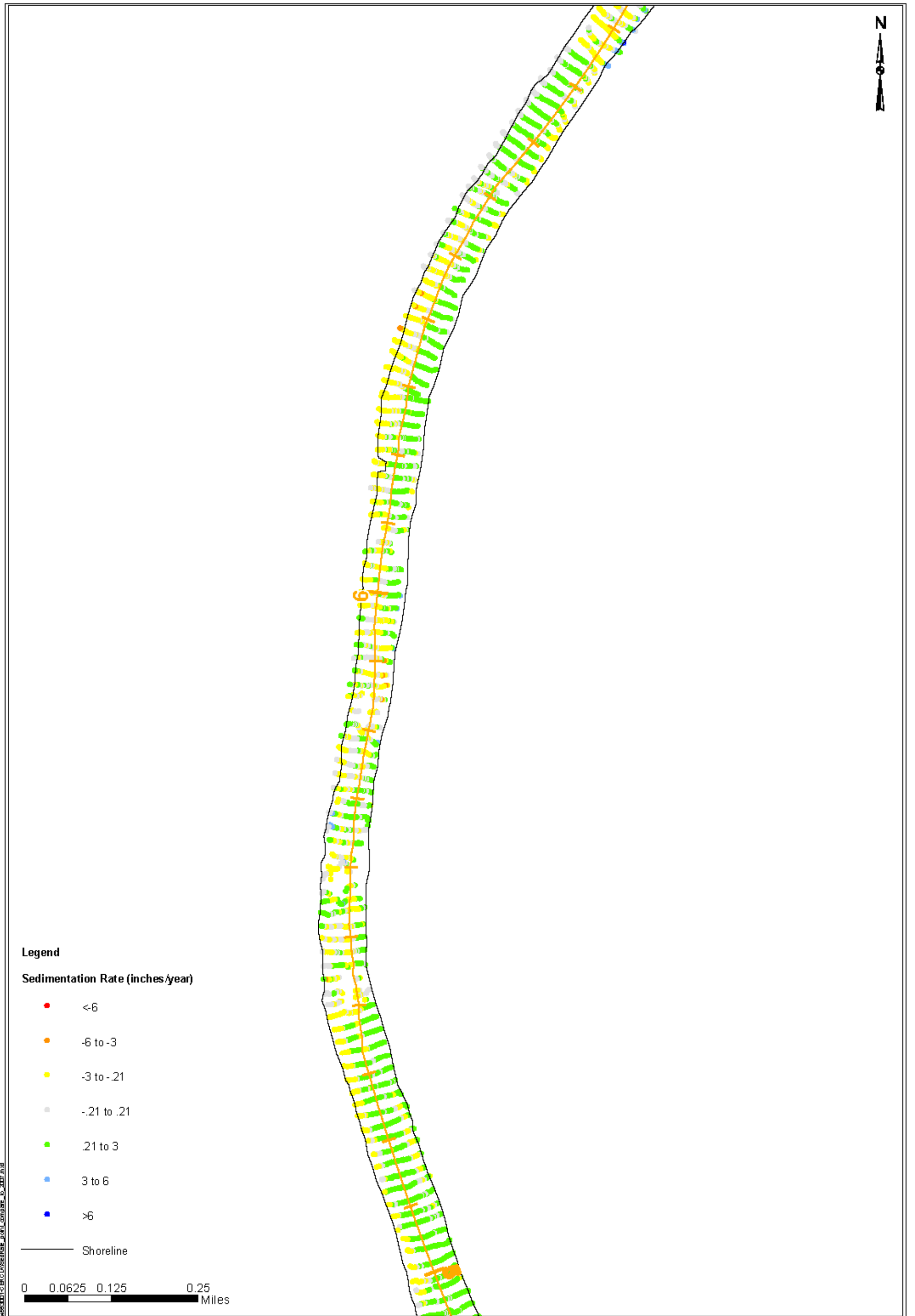


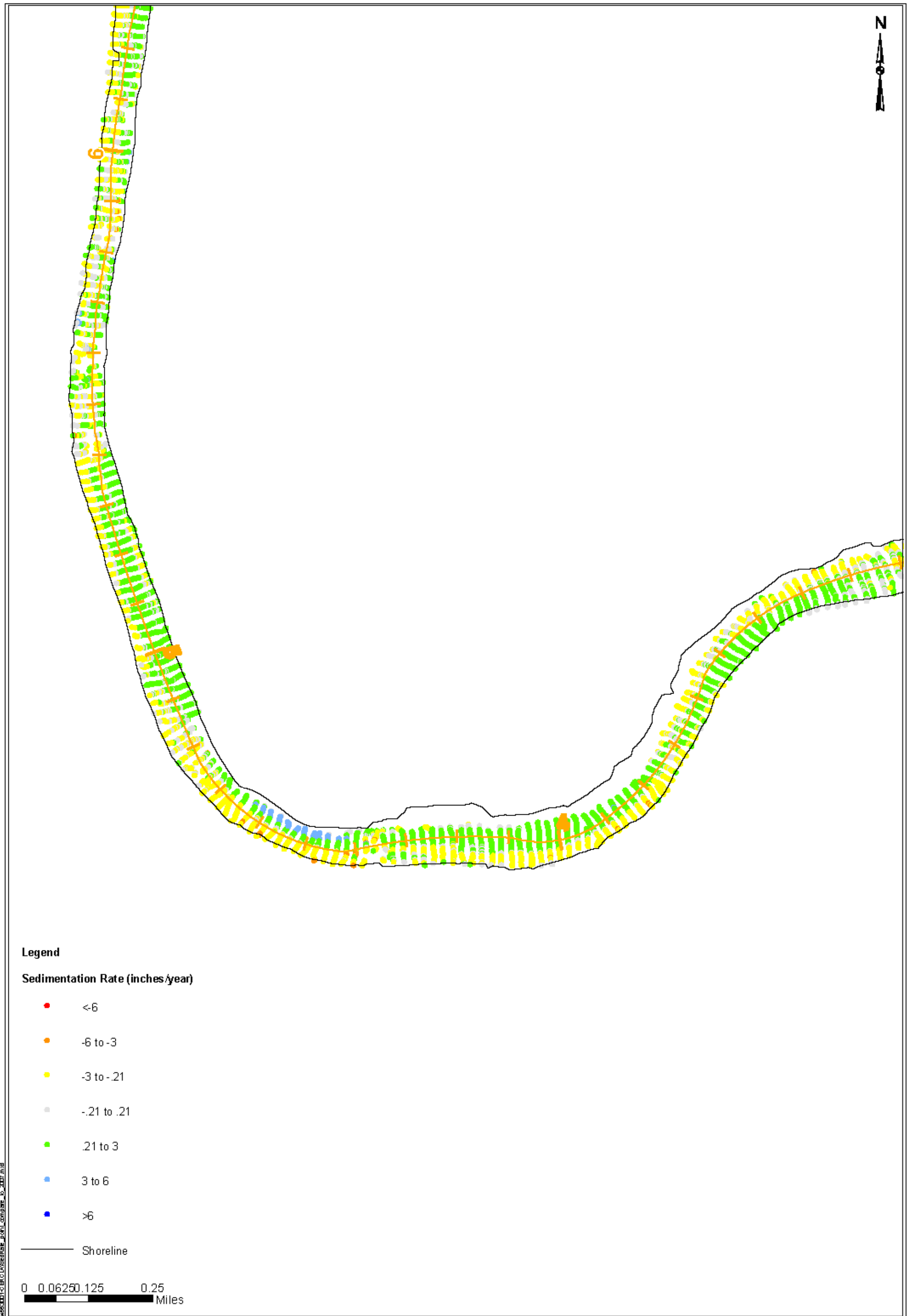
Net Sedimentation Rate 1989-2007

Lower Passaic River Restoration Project

Figure 11 - 9e

2009





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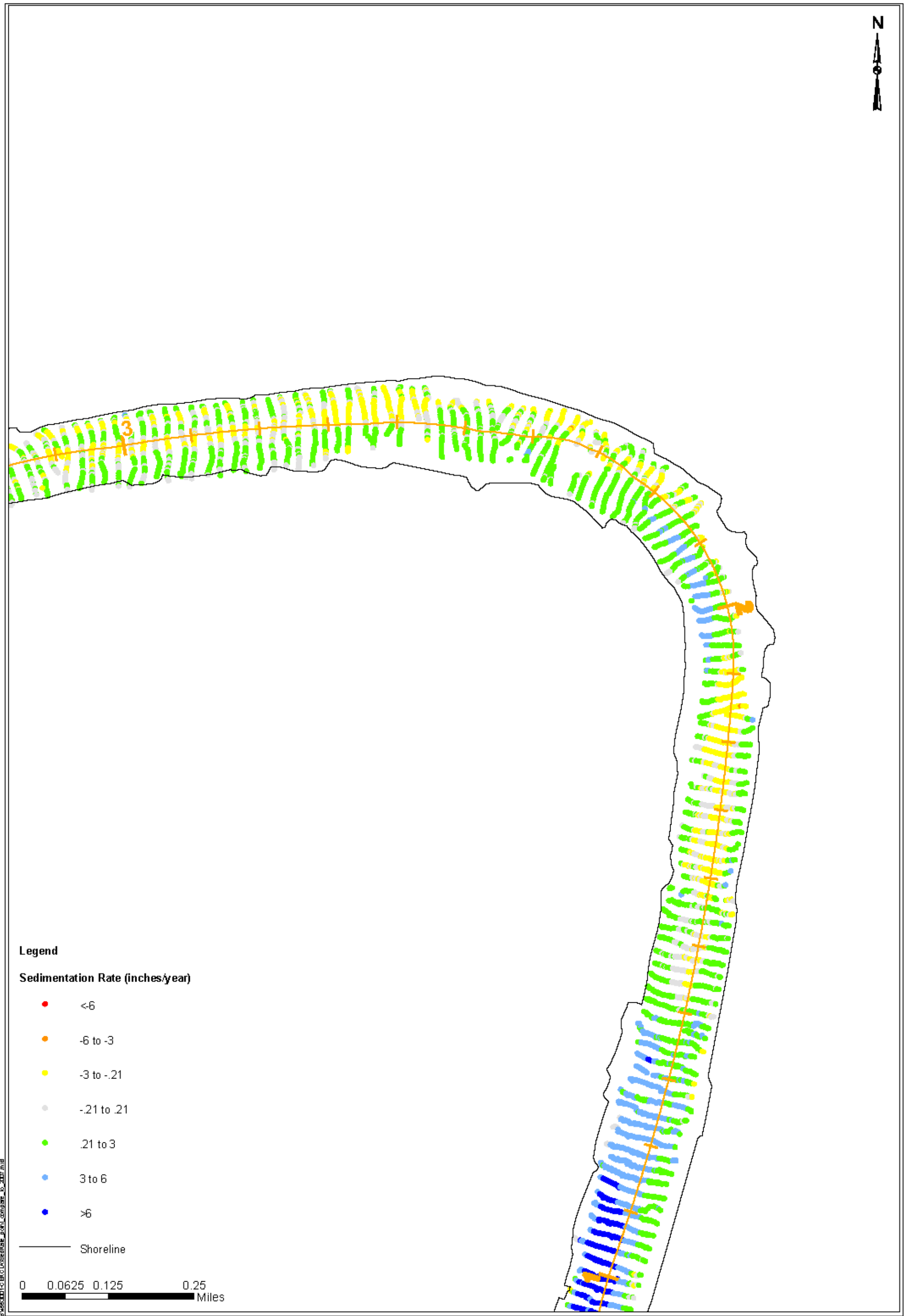


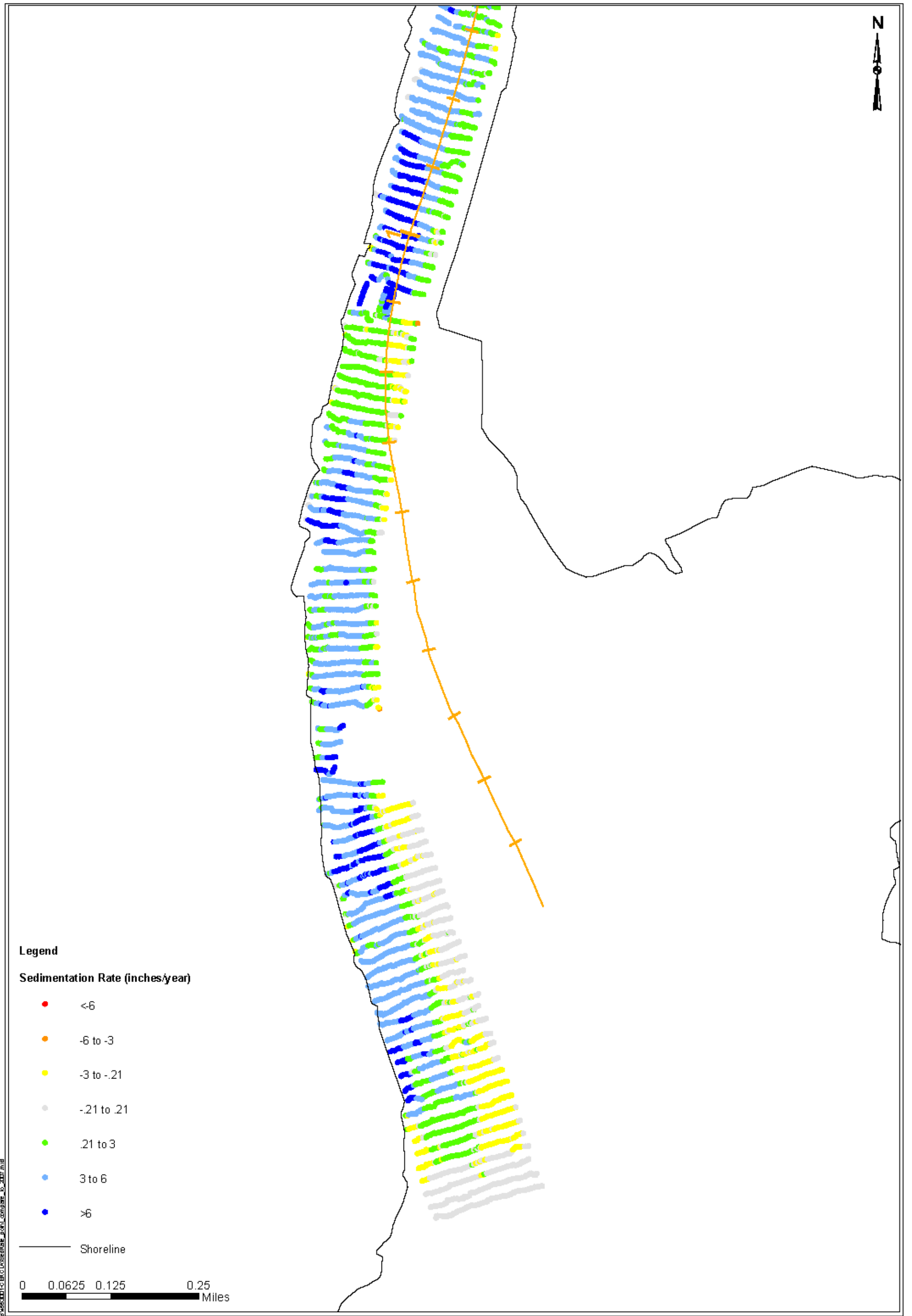
Net Sedimentation Rate 1989-2007

Lower Passaic River Restoration Project

Figure 11 - 9g
2009







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Net Sedimentation Rate 1989-2007

Lower Passaic River Restoration Project

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Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

Figure 11 - 10a

2009

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Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

Figure 11 - 10b

2009



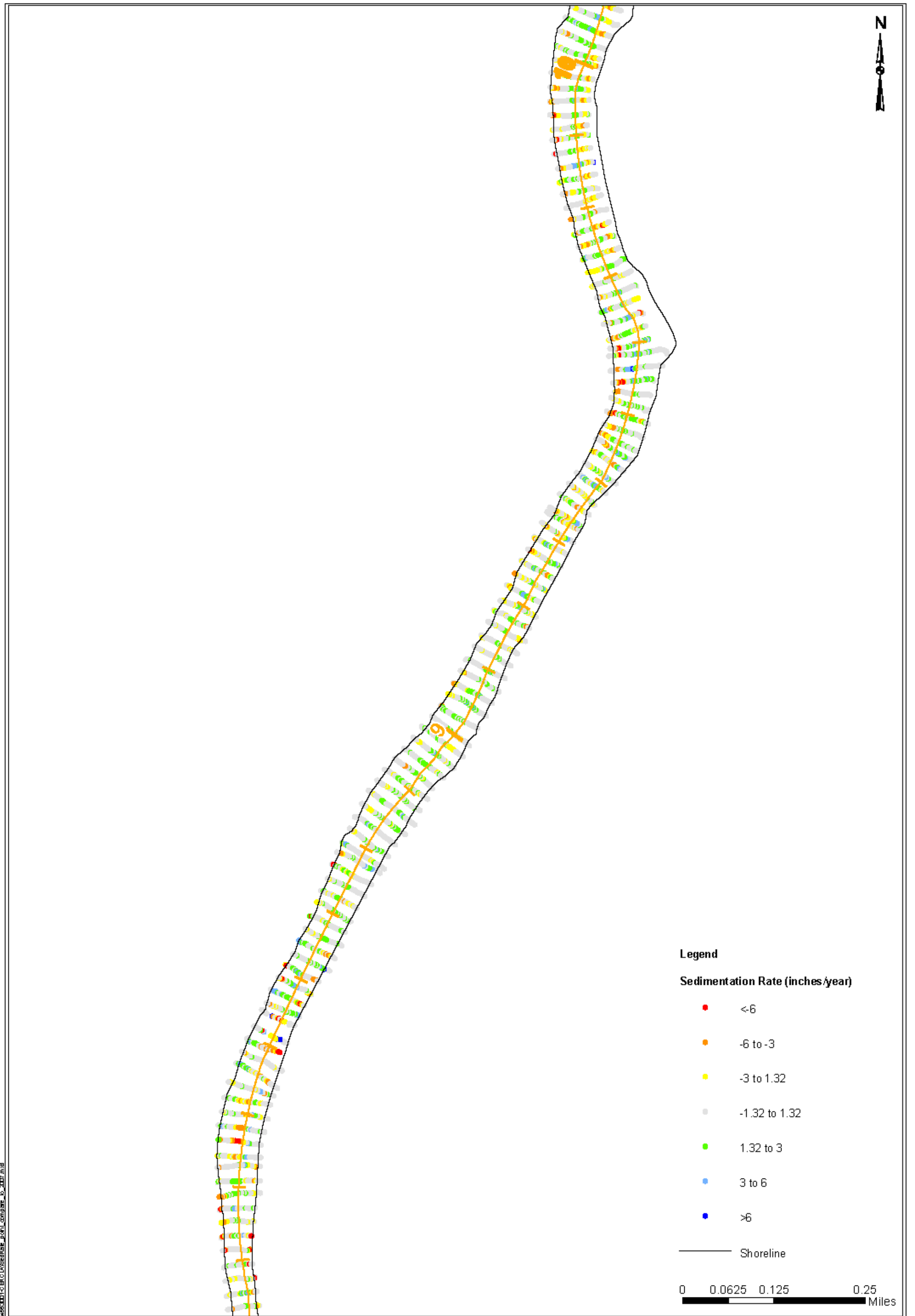
Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

Figure 11 - 10c

2009

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Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

Figure 11 - 10d

2009



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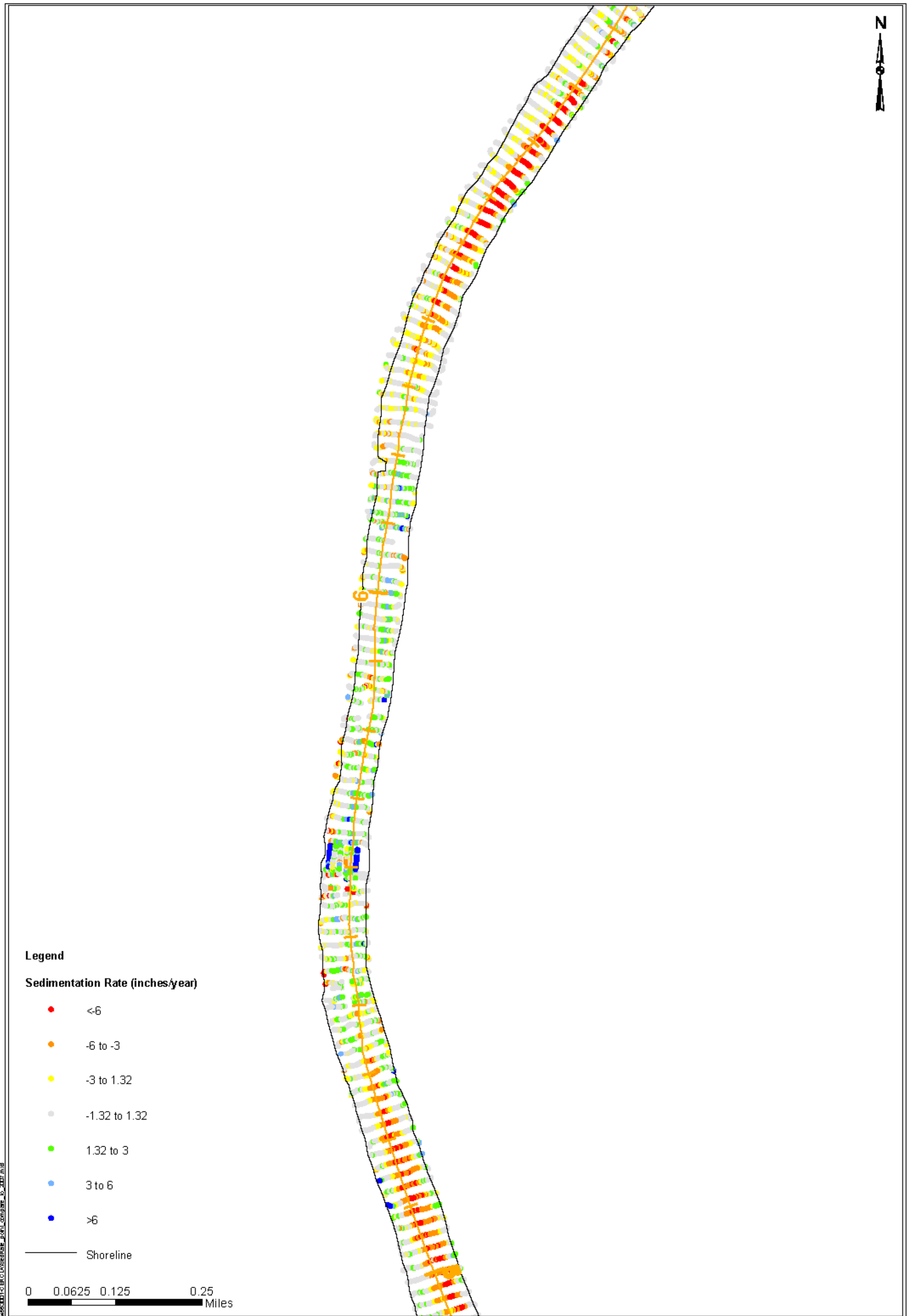


Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

Figure 11 - 10e

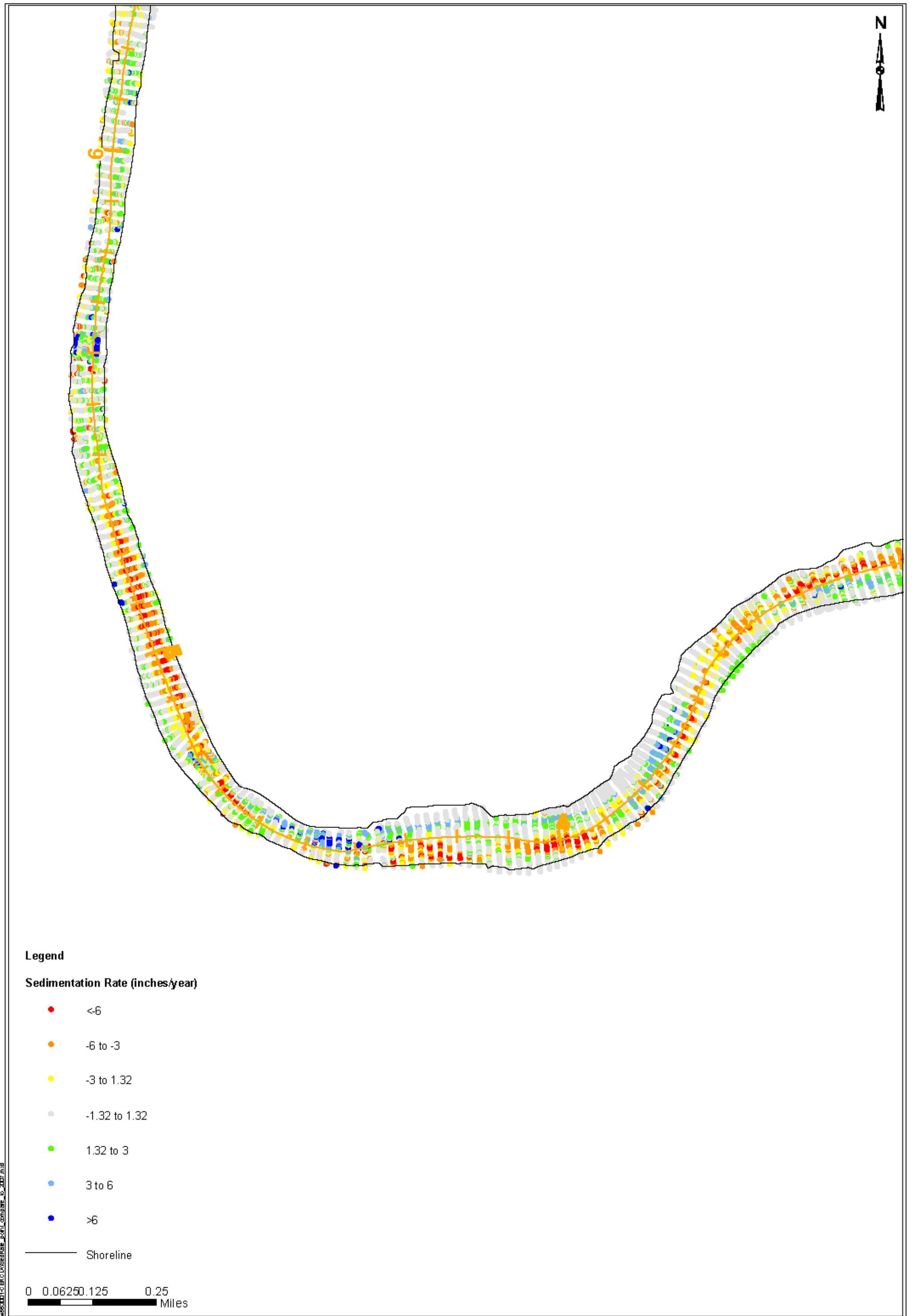
2009



Net Sedimentation Rate 2004-2007

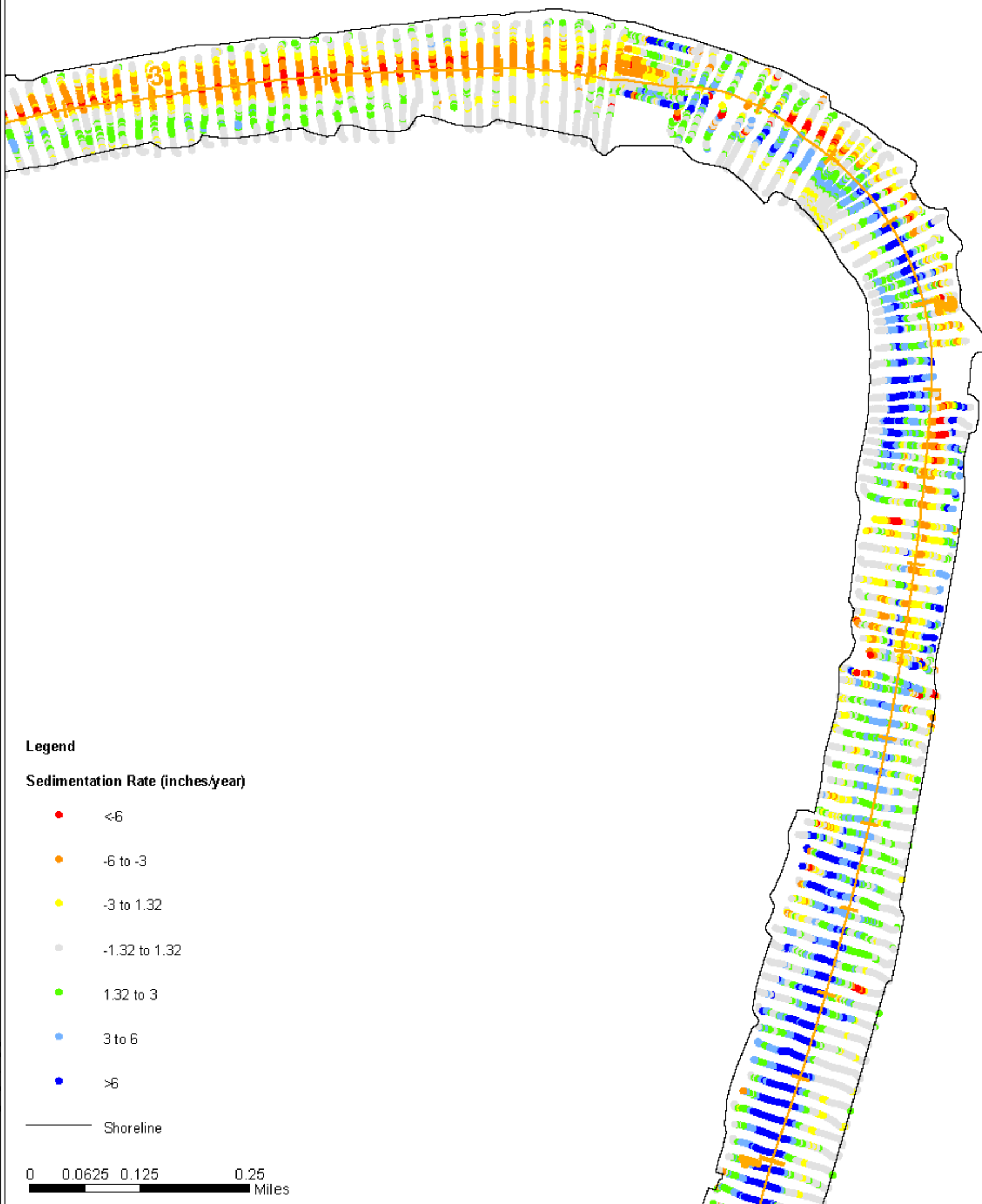
Lower Passaic River Restoration Project





Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

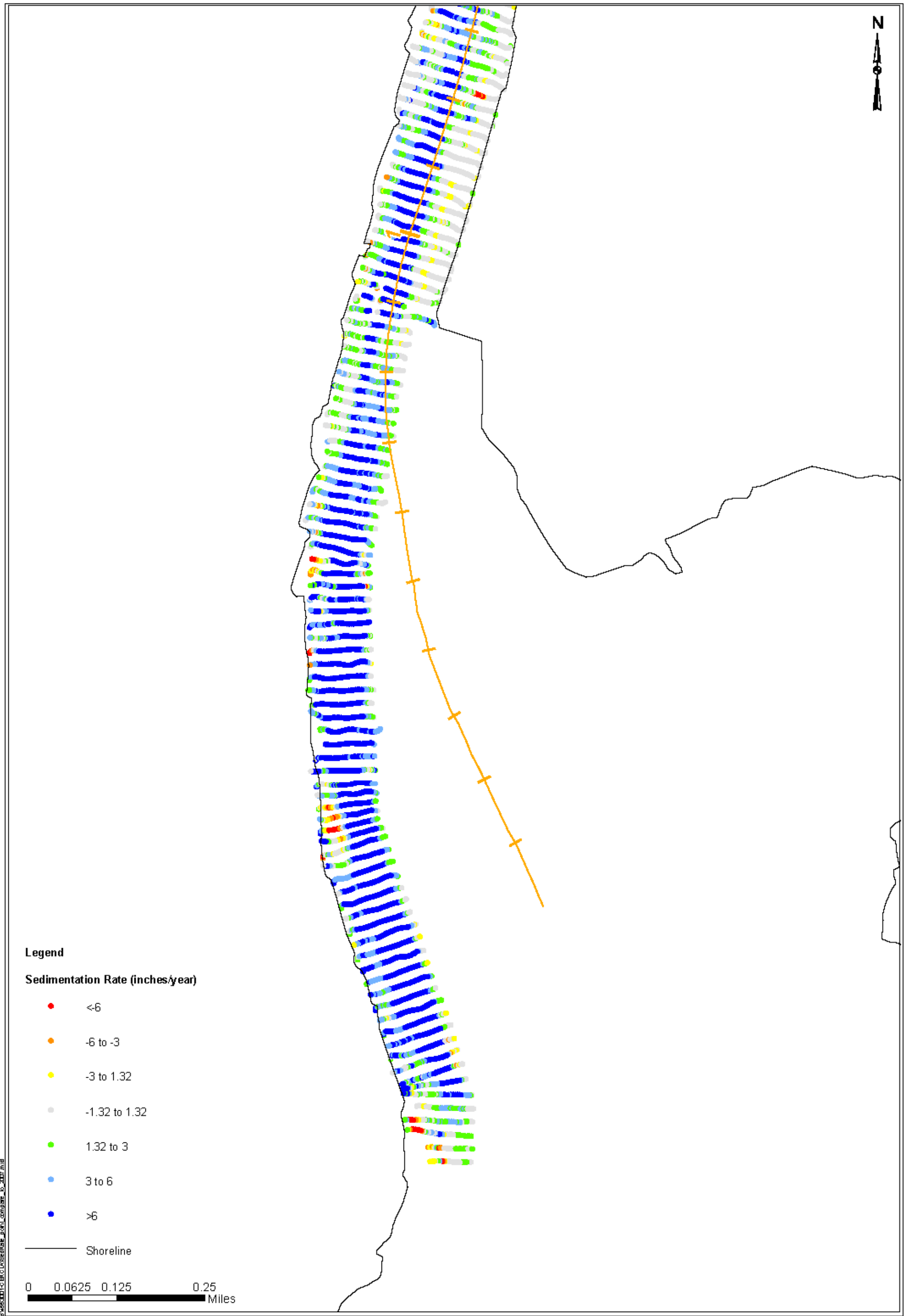


# Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

Figure 11 - 10h

2009

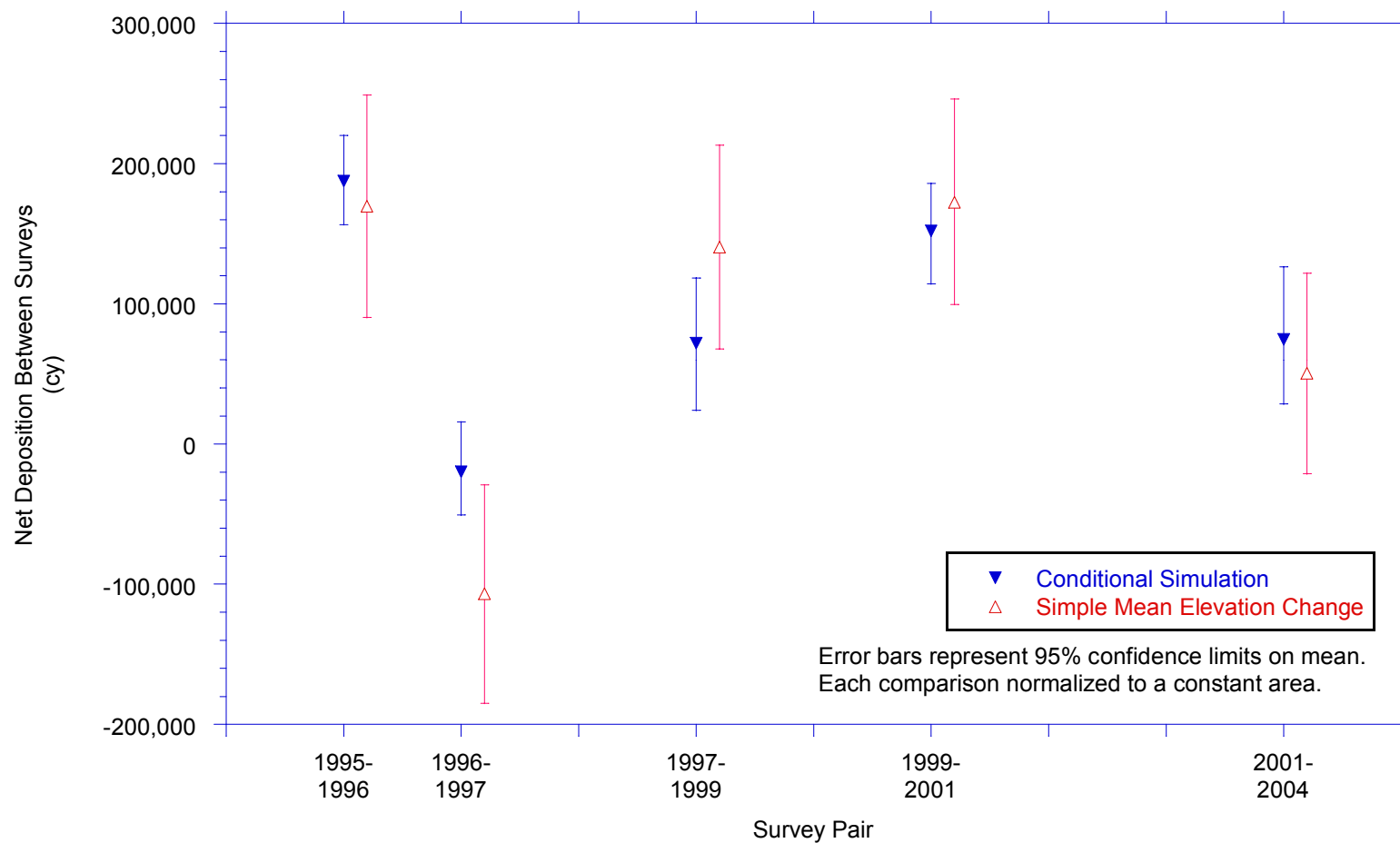


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Net Sedimentation Rate 2004-2007

Lower Passaic River Restoration Project

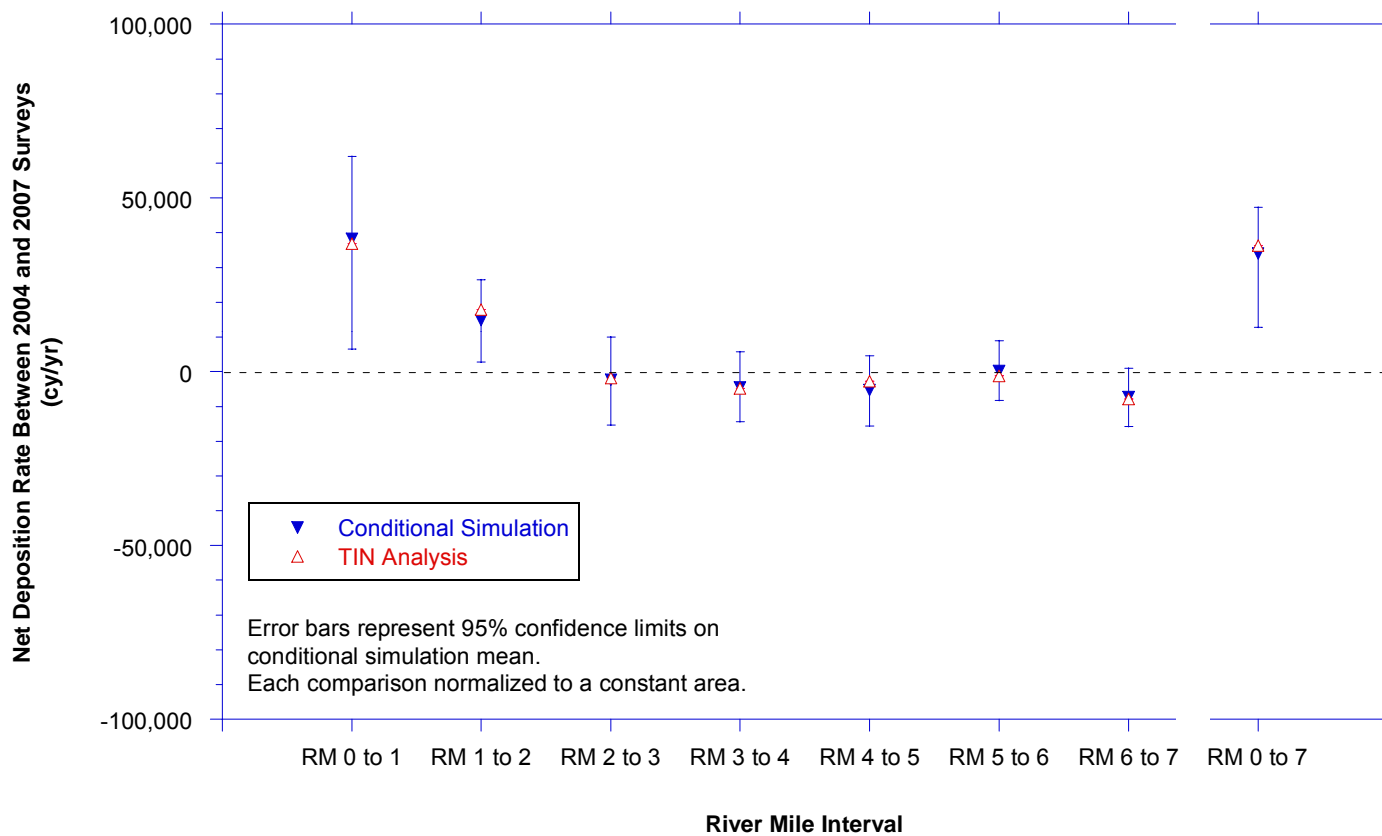


Comparison of Net Deposition Estimates for RM 0 to 7  
Conditional Simulation vs. Simple Mean Elevation Change

*Lower Passaic River Restoration Project*

Figure 11-11

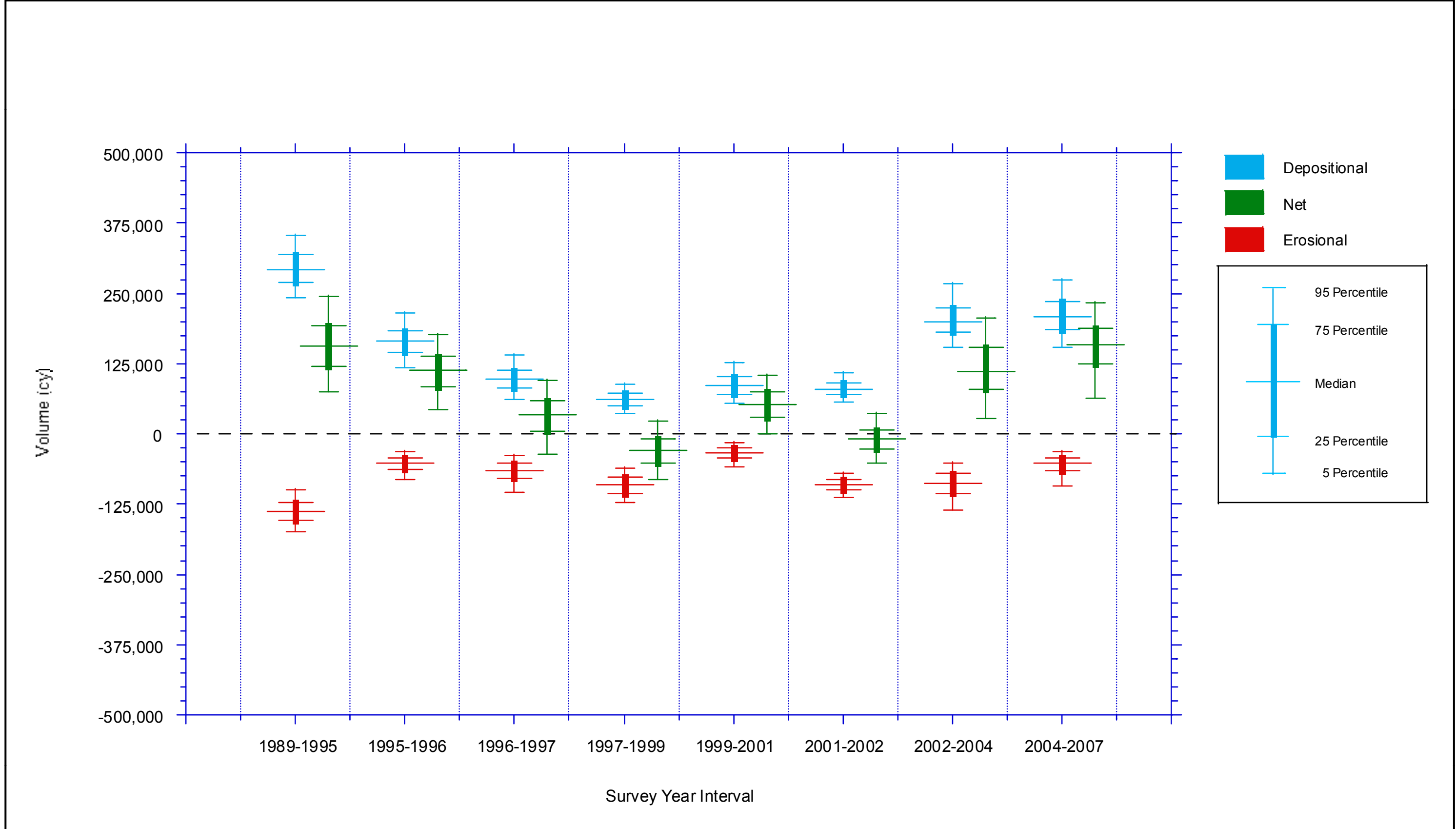
2009

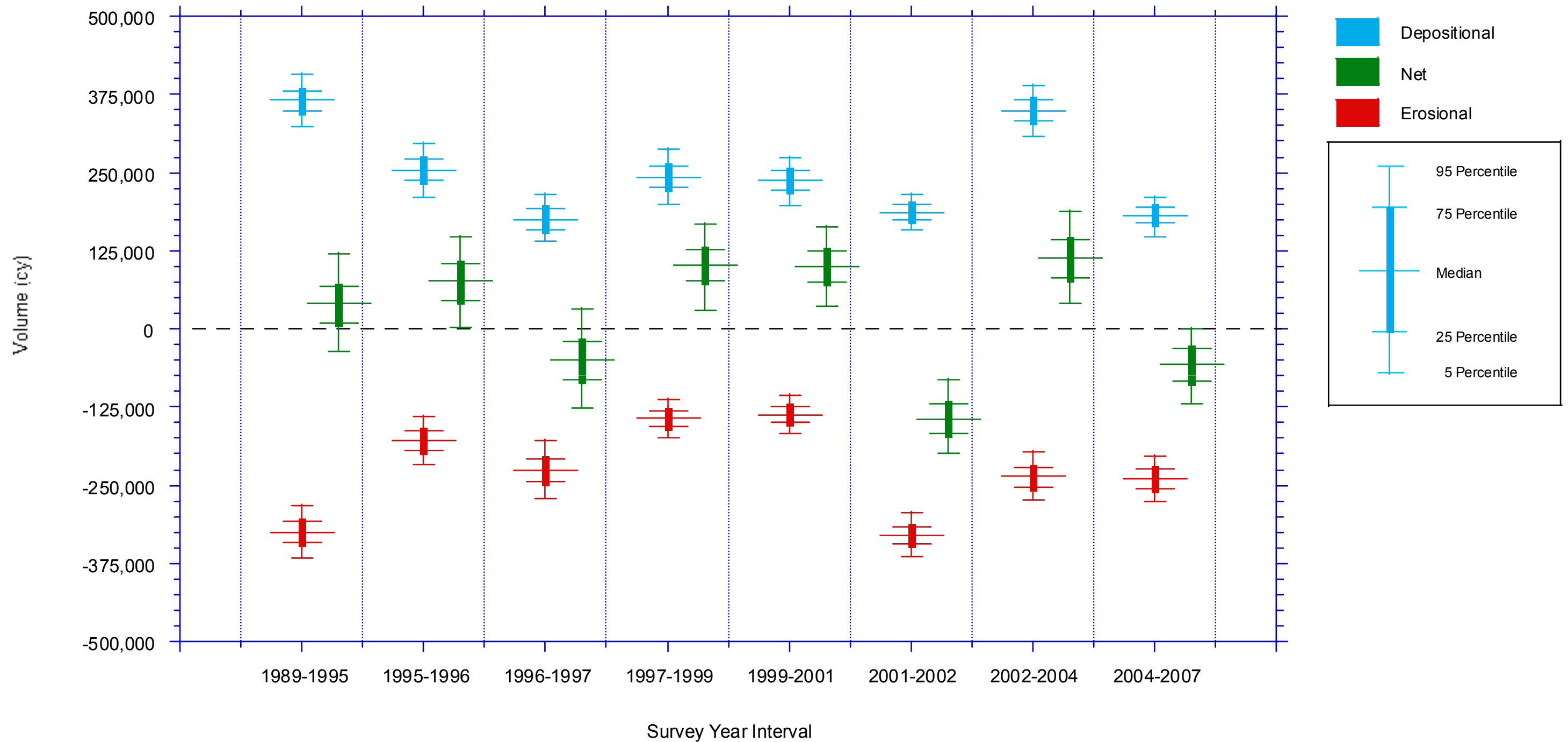


Comparison of Net Deposition Rates for RM 0 to 7  
Conditional Simulation vs. TIN Results  
2004 to 2007 Survey Pair  
*Lower Passaic River Restoration Project*

Figure 11-12

2009



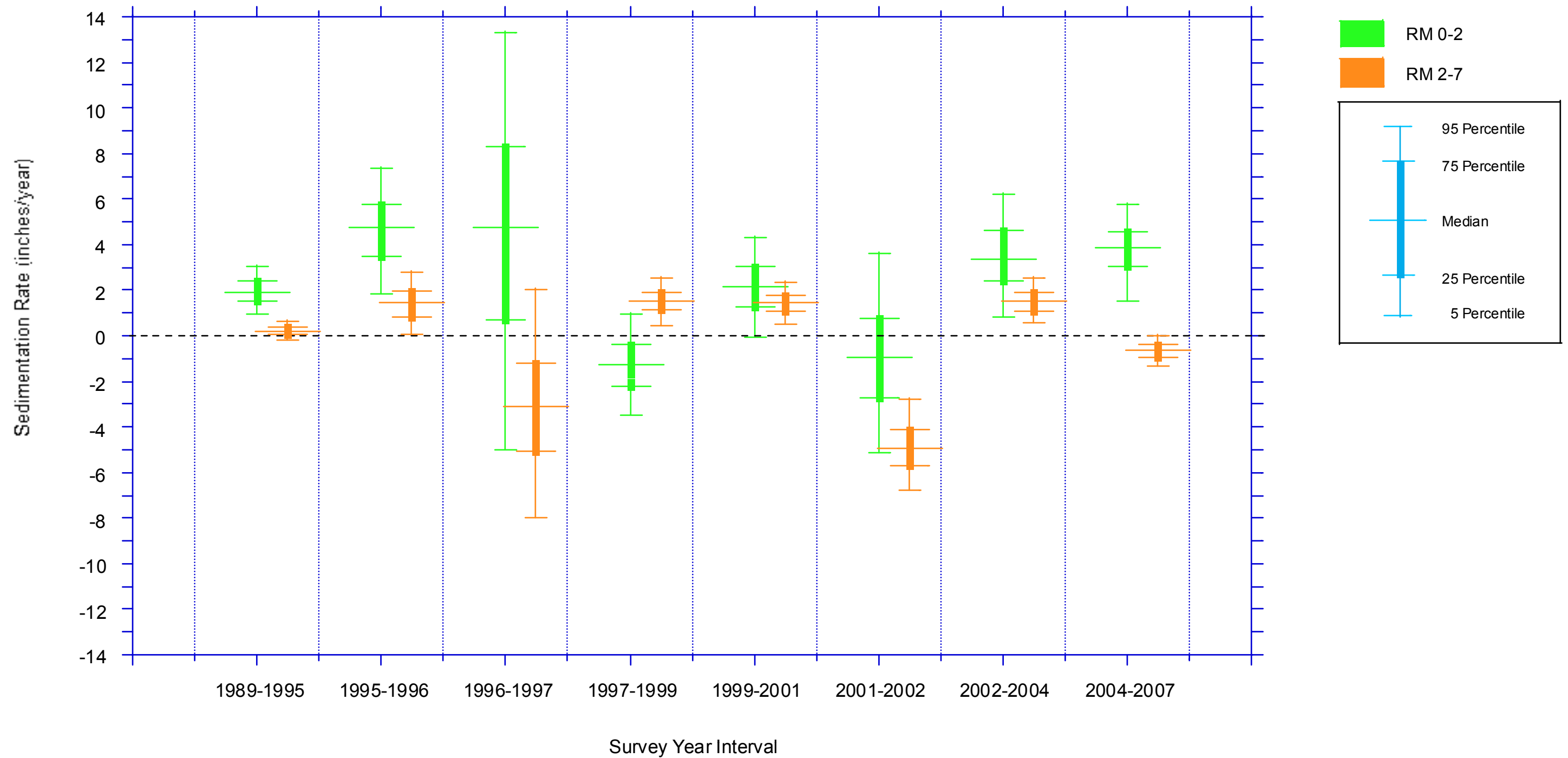


## Conditional Simulation Results – RM 2 to 7 Volume

*Lower Passaic River Restoration Project*

Figure 11-14

2009



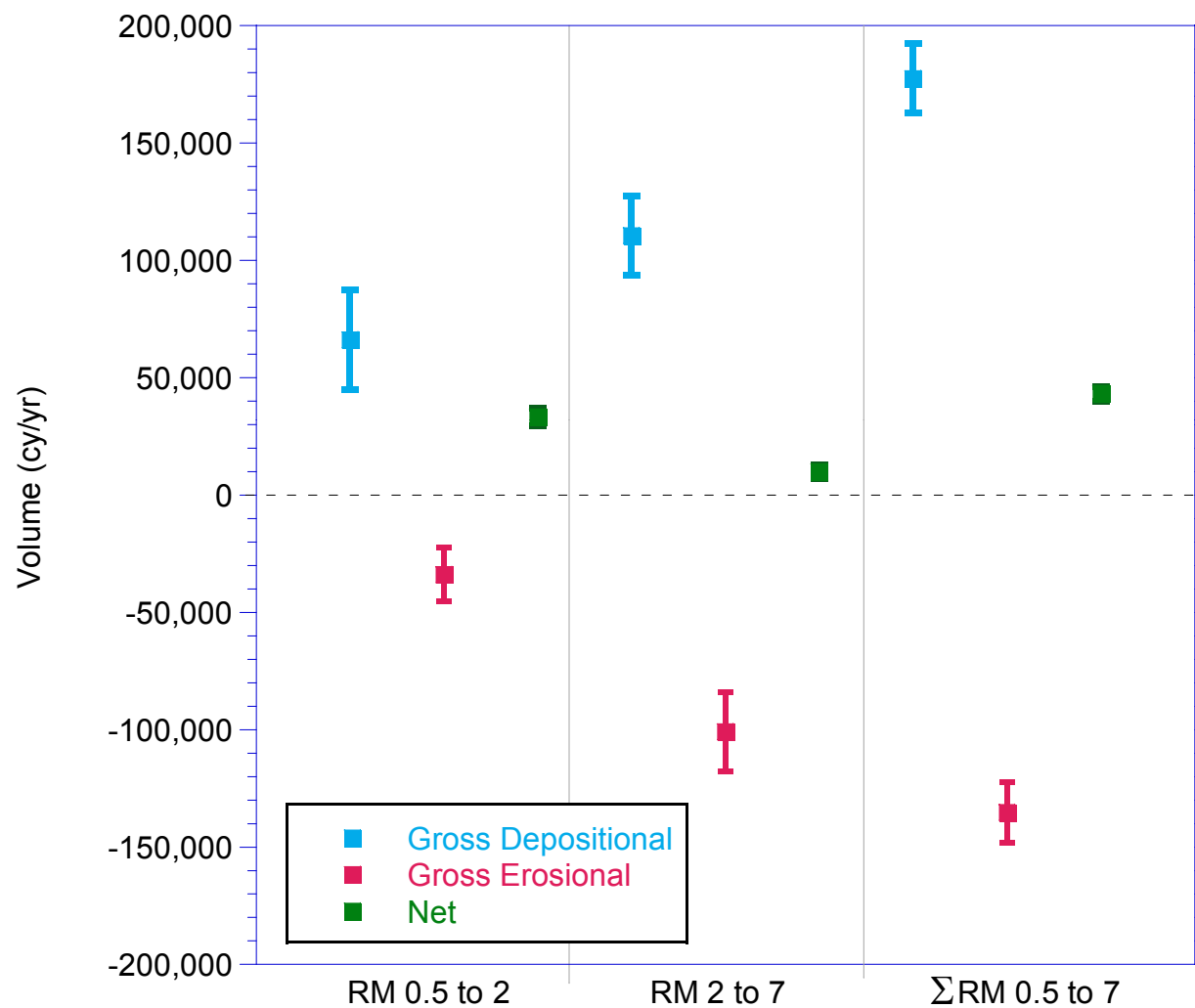
# Conditional Simulation Results – Sedimentation Rate

*Lower Passaic River Restoration Project*

Figure 11-15

2009





Conditional Simulation Results for RM 0.5 to 7

*Lower Passaic River Restoration Project*

Figure 11-16

2009











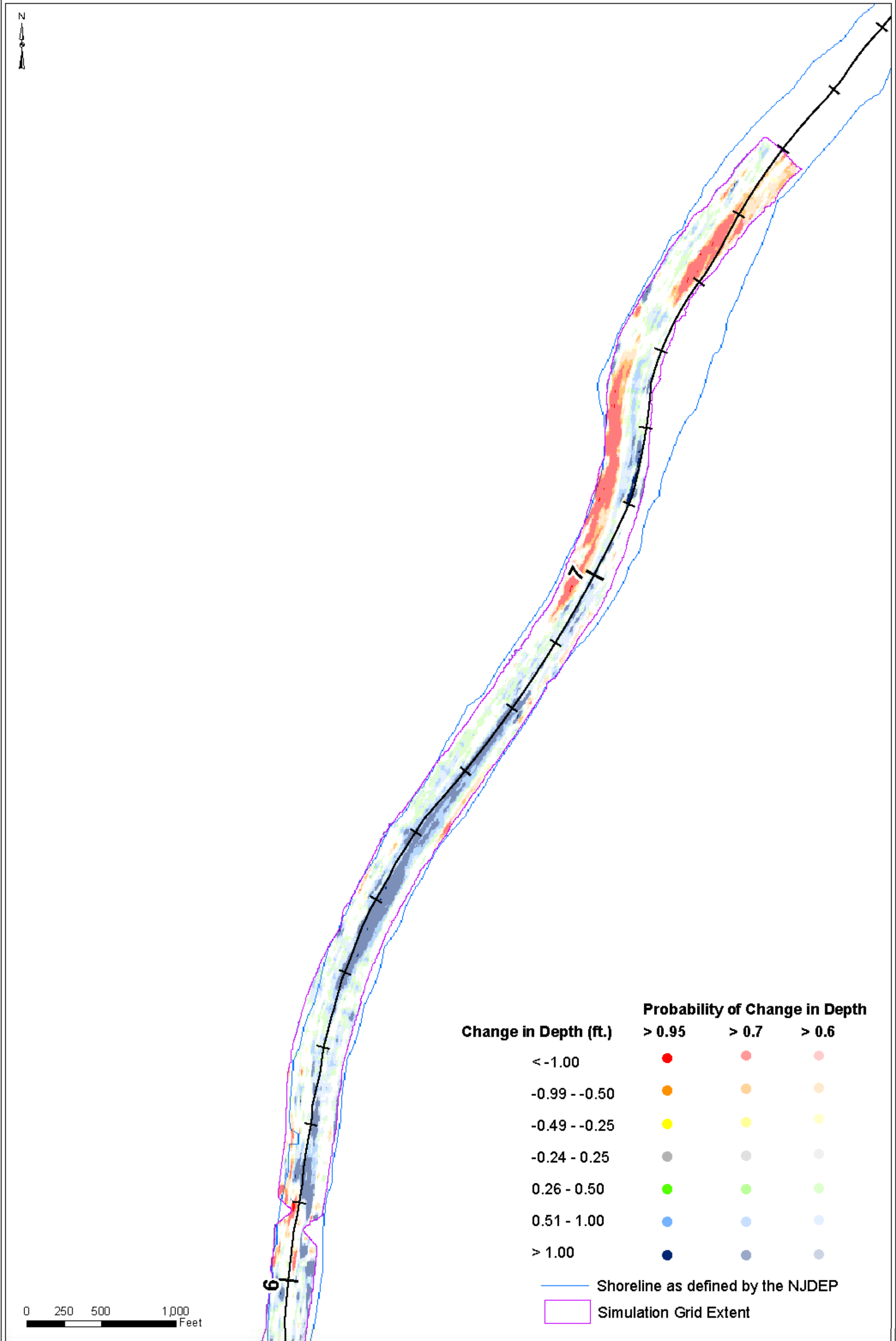












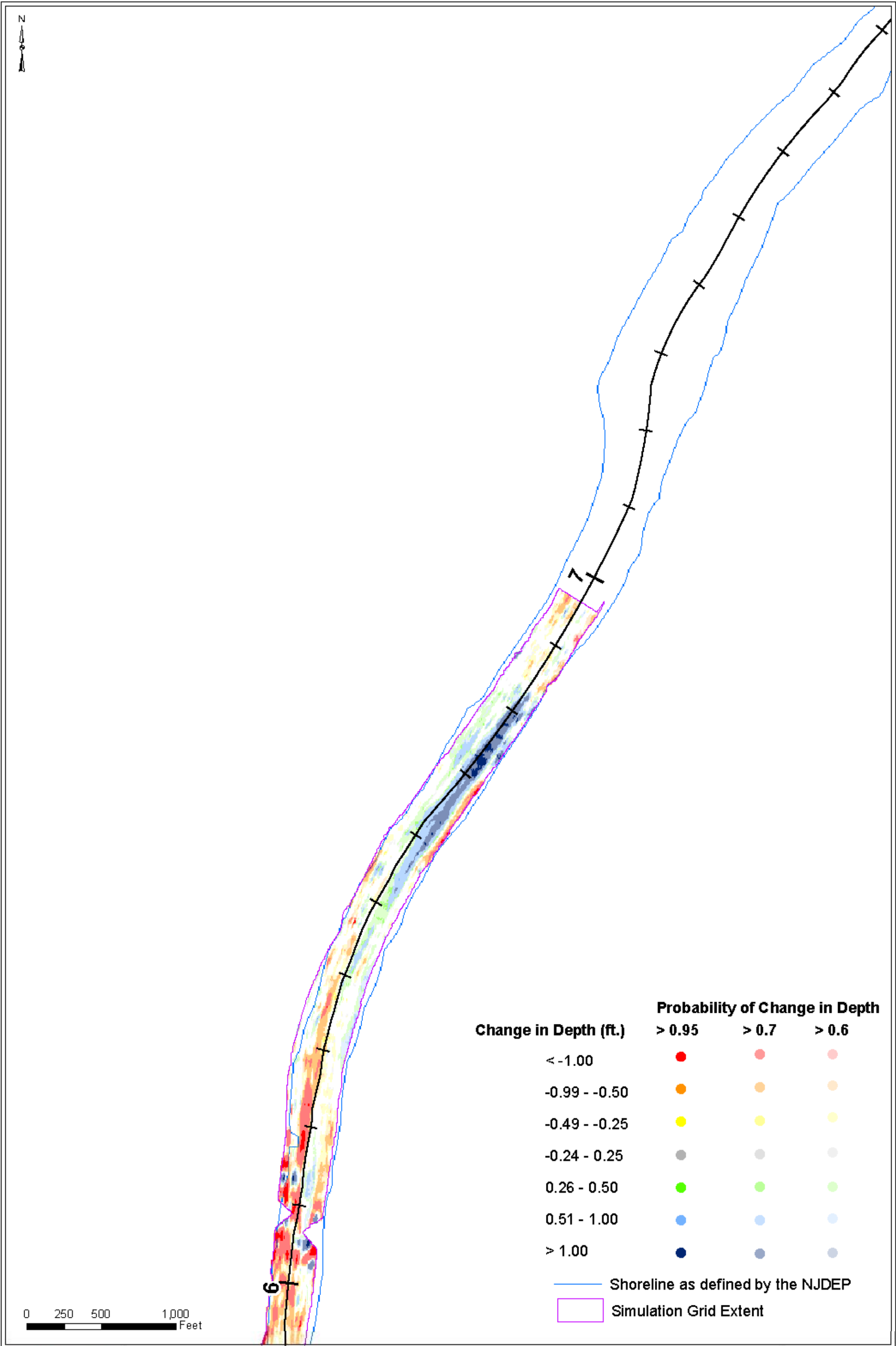
Conditional Simulation Results - RM 6 to 7  
2002 - 2004

Figure 11-17i

June 2009



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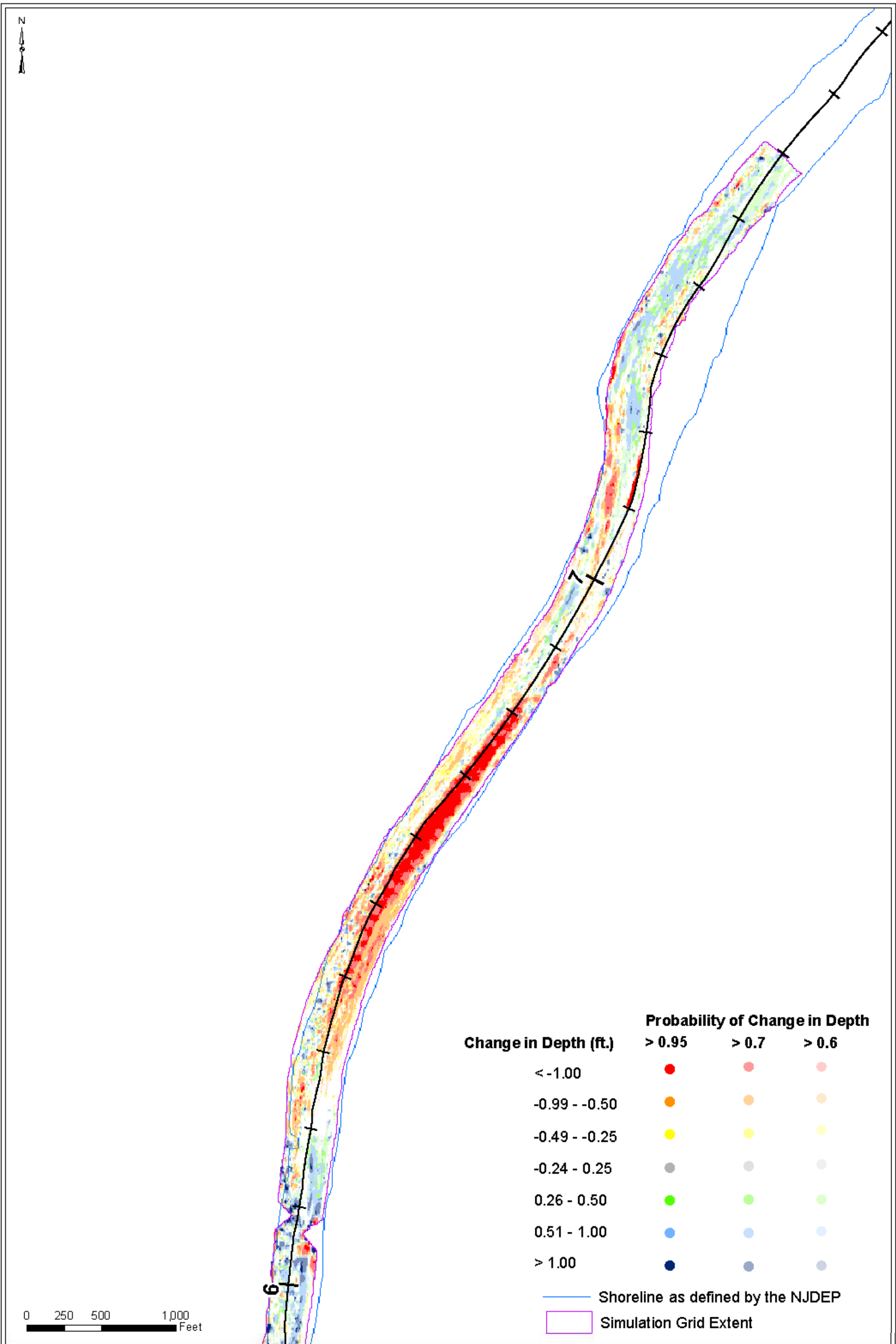
**Conditional Simulation Results - RM 6 to 7  
2001 - 2004**

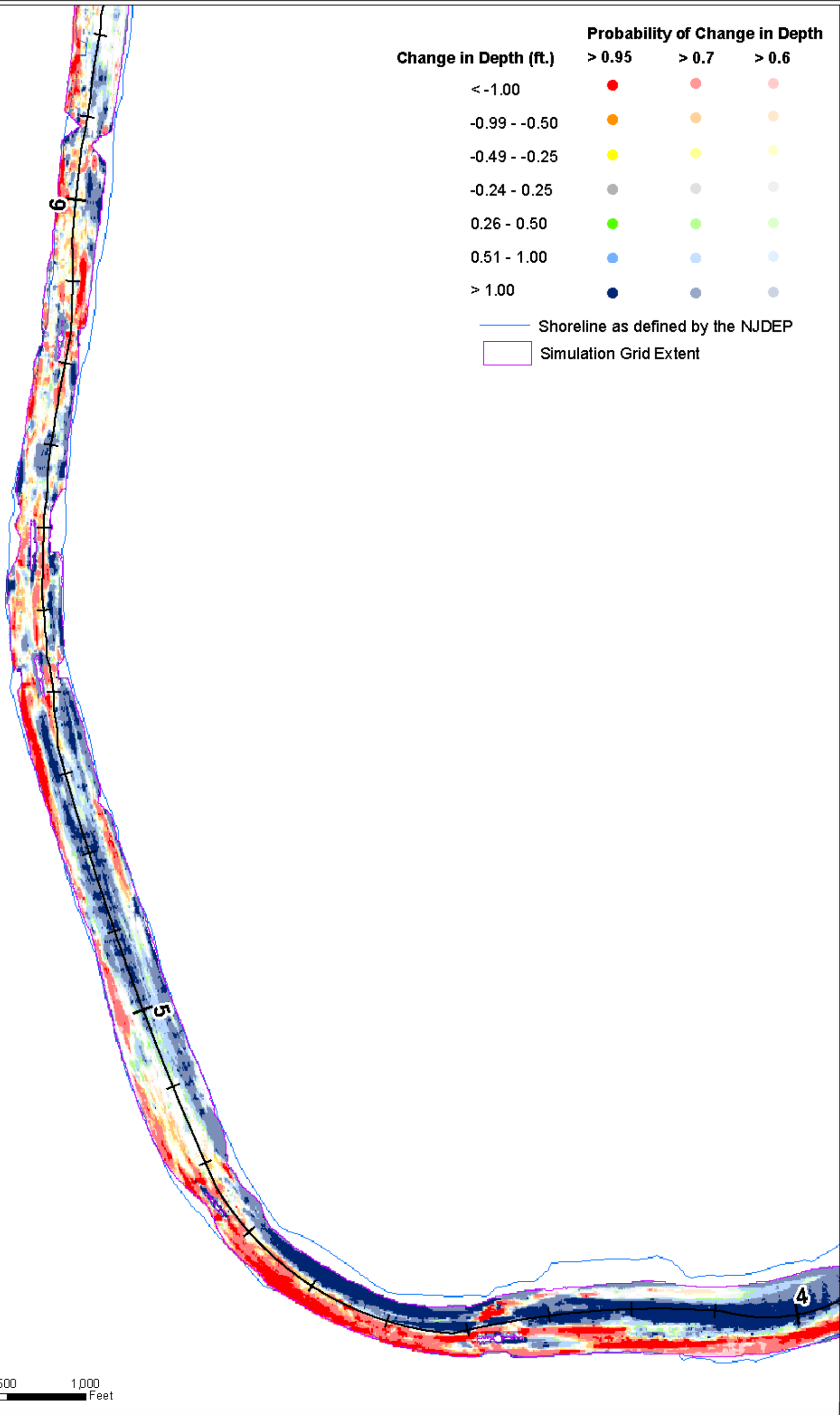
*Lower Passaic River Restoration*

Figure 11-17j

June 2009





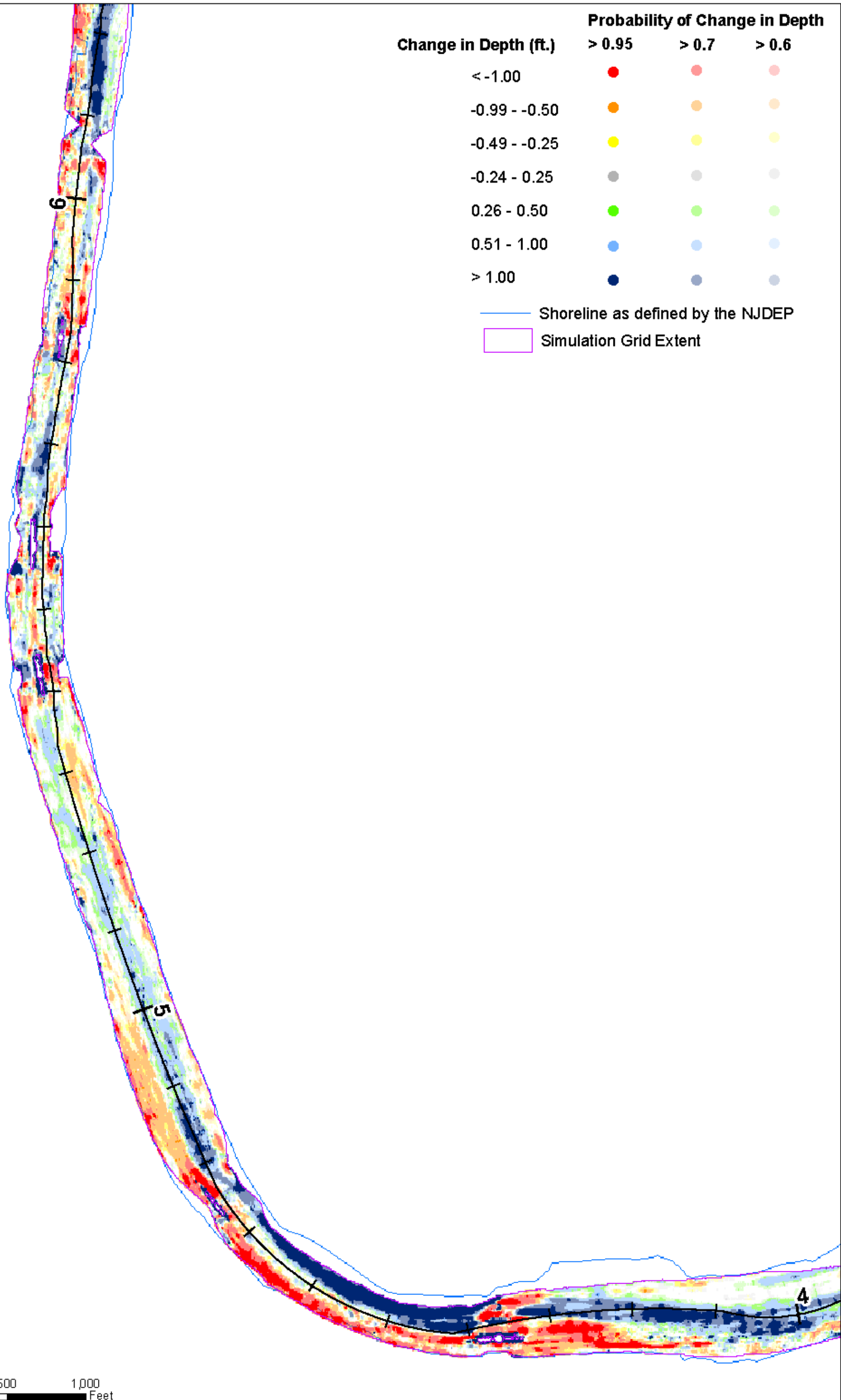


**Conditional Simulation Results - RM 4 to 6**  
**1989 - 2007**

*Lower Passaic River Restoration*

Figure 11-18a

June 2009

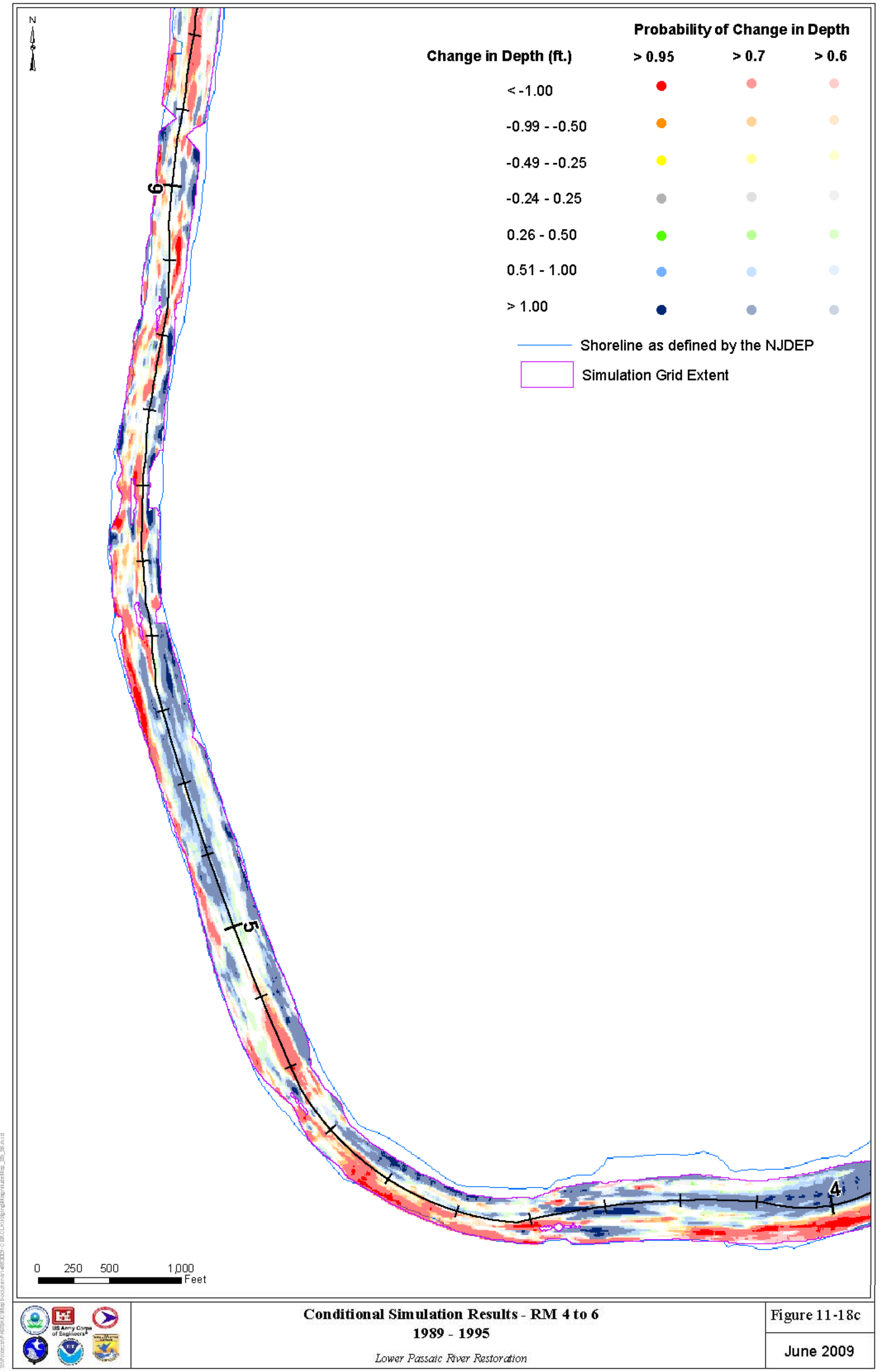


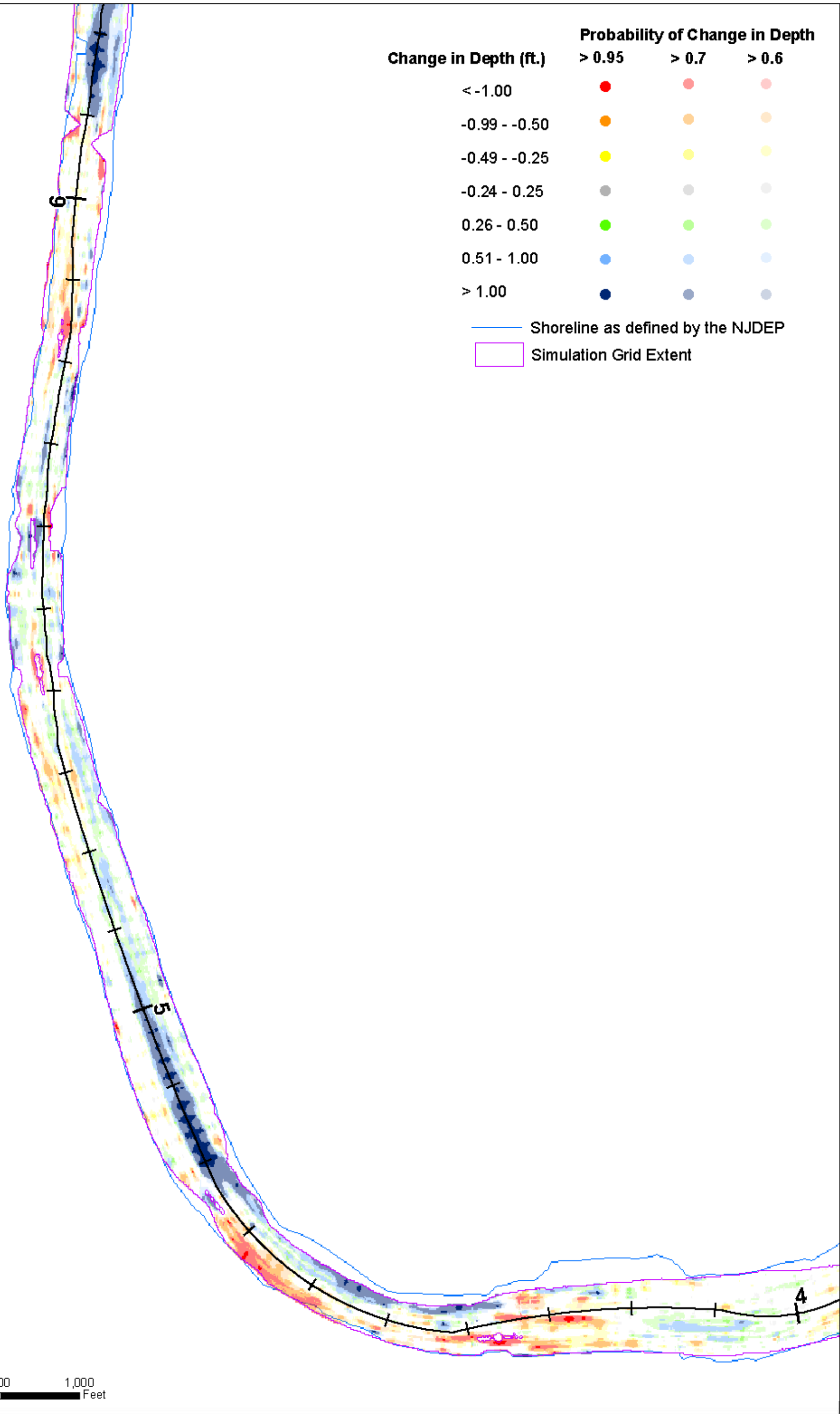
**Conditional Simulation Results - RM 4 to 6**  
**1995 -2007**

*Lower Passaic River Restoration*

**Figure 11-18b**  
**June 2009**





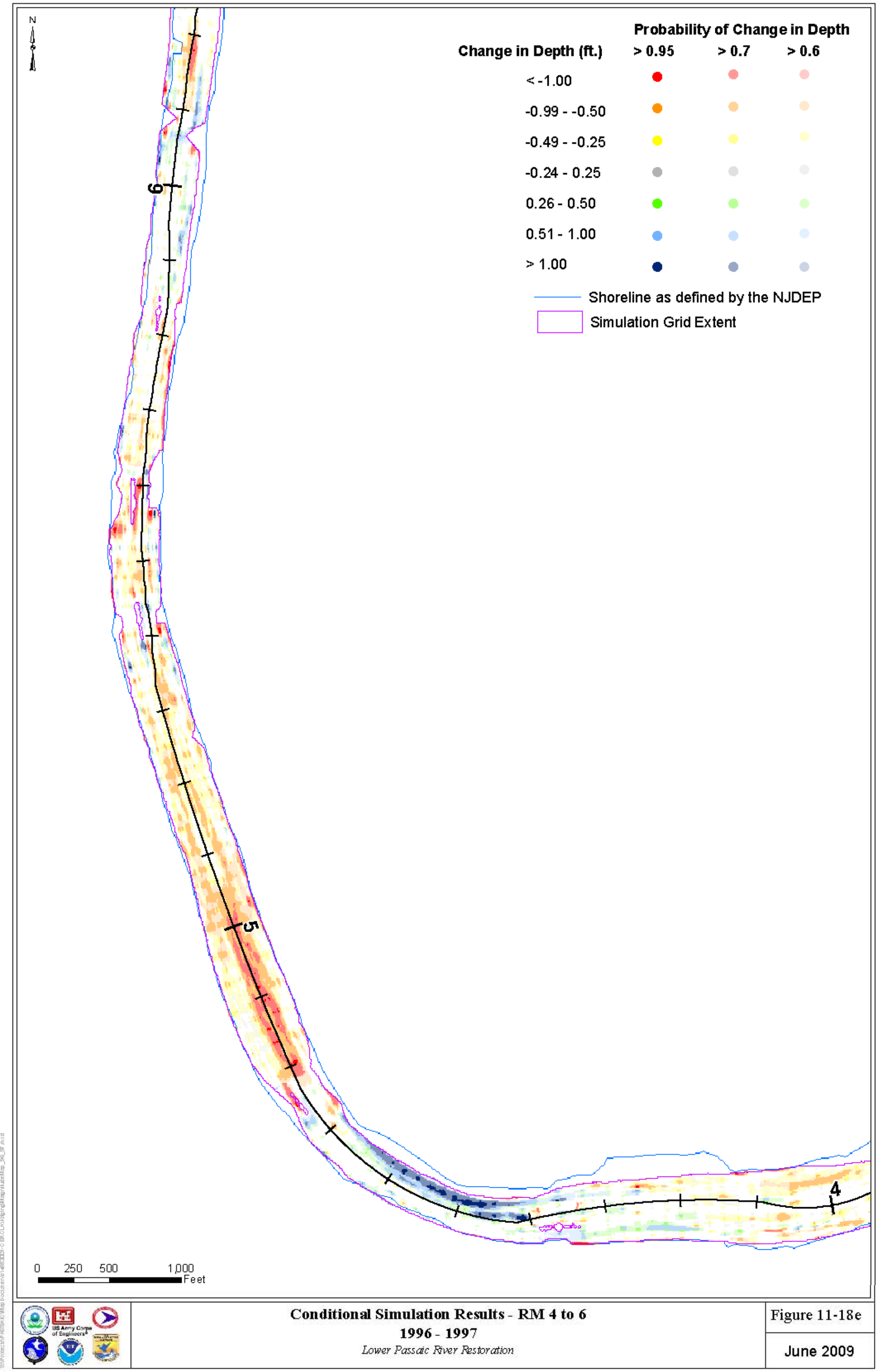


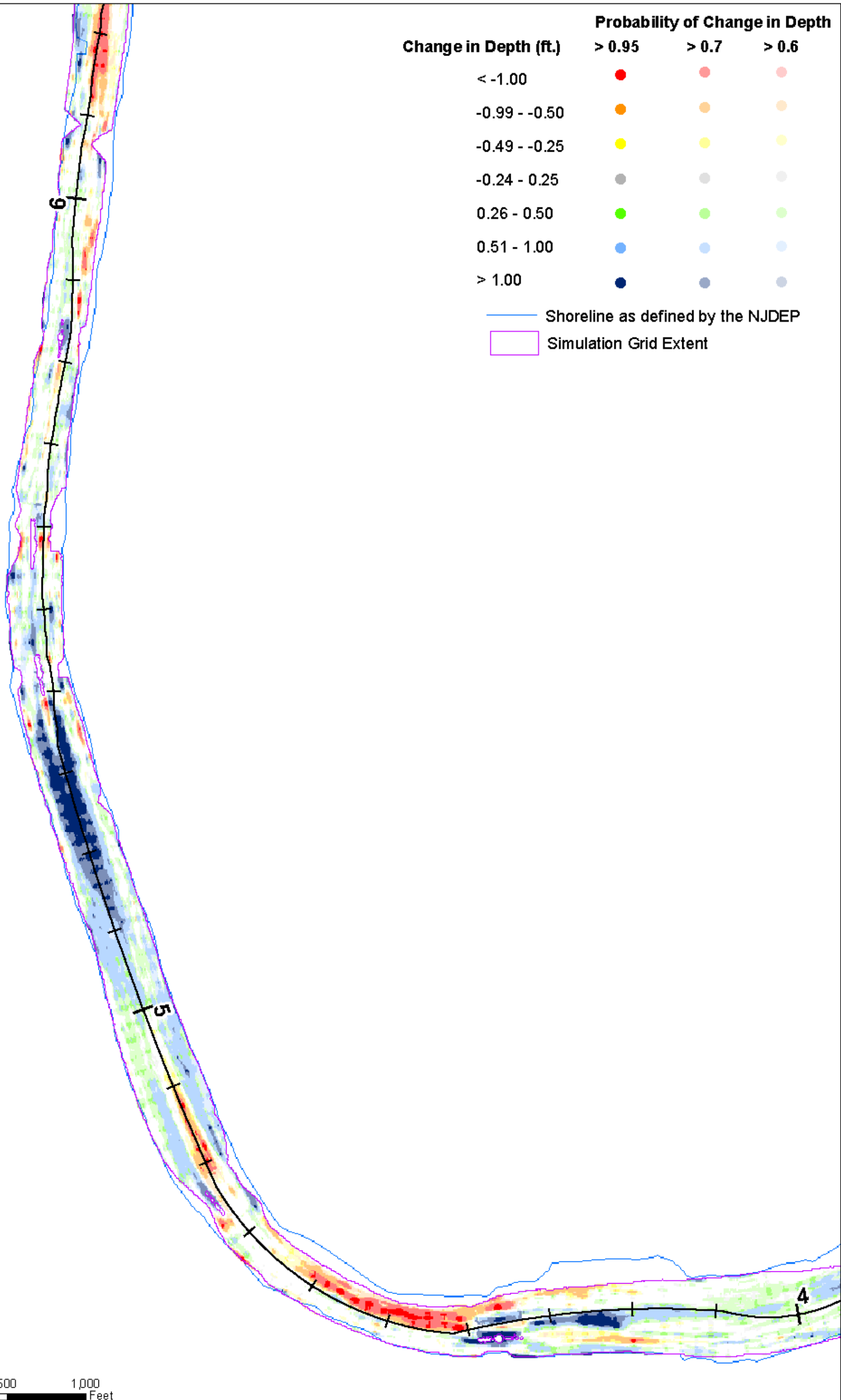
**Conditional Simulation Results - RM 4 to 6**  
**1995 - 1996**

Figure 11-18d

June 2009





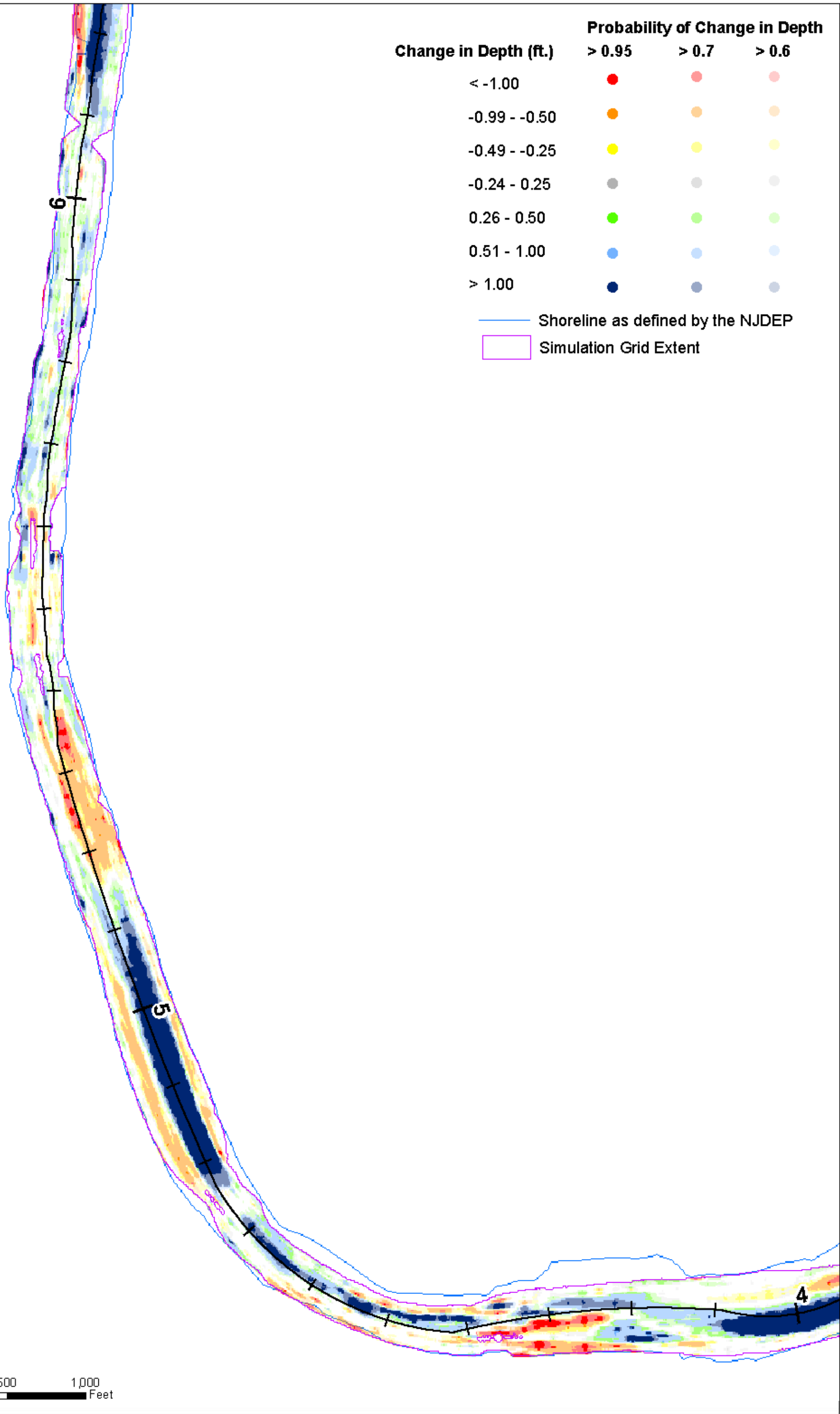


**Conditional Simulation Results - RM 4 to 6**  
**1997 - 1999**

Figure 11-18f

June 2009





0 250 500 1,000 Feet



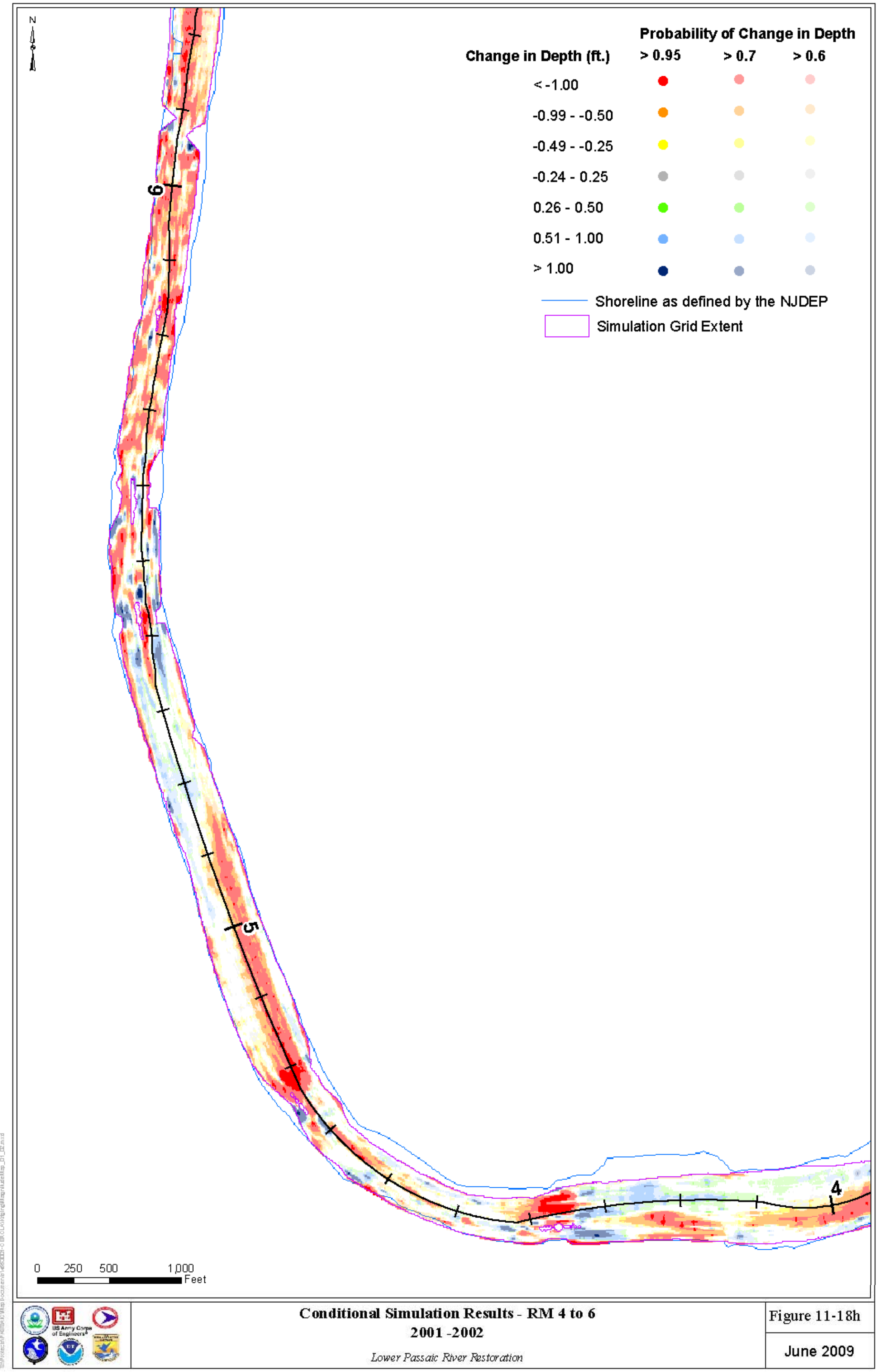
**Conditional Simulation Results - RM 4 to 6  
1999 -2001**

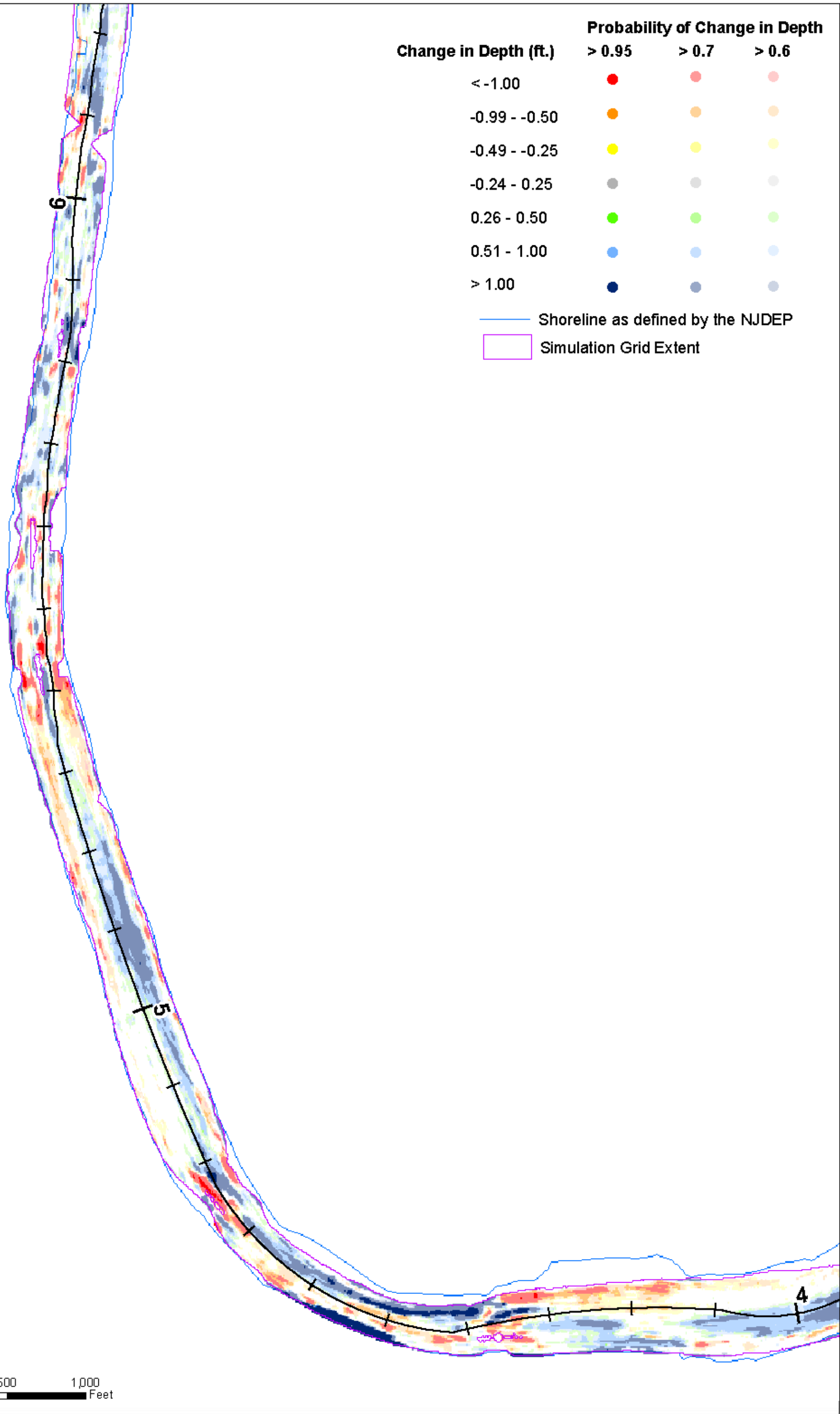
*Lower Passaic River Restoration*

Figure 11-18g

June 2009







0 250 500 1,000 Feet

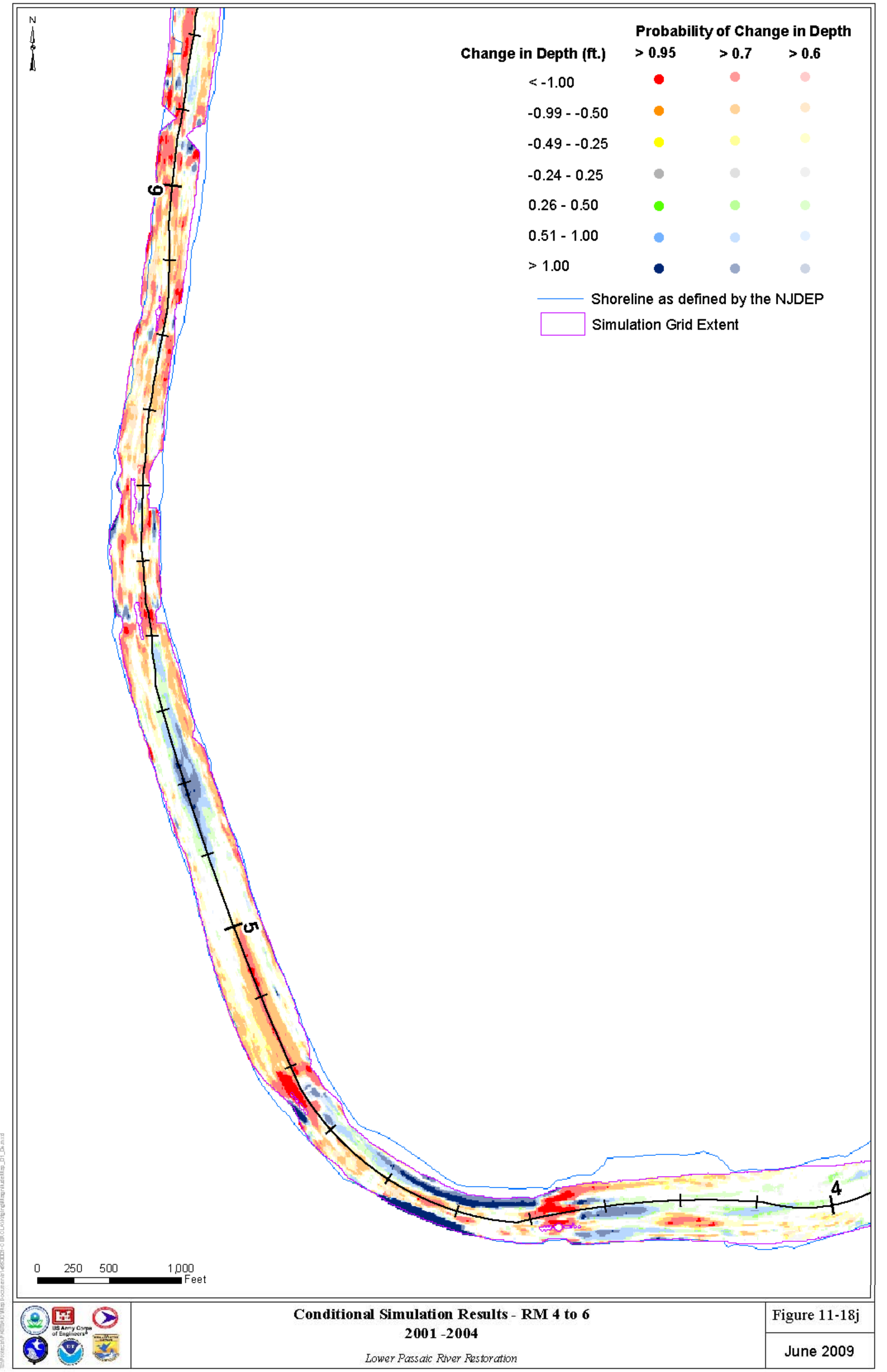


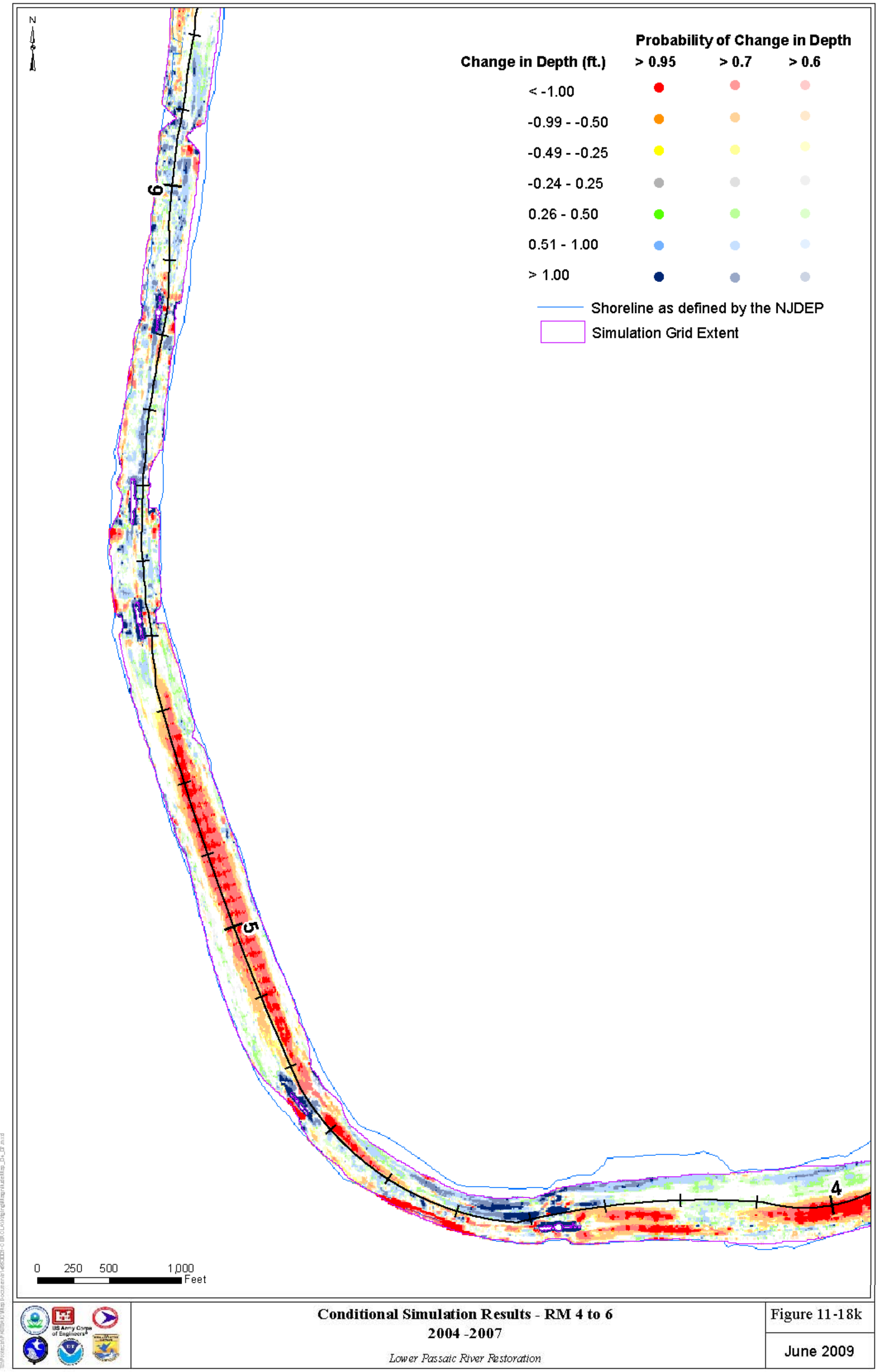
**Conditional Simulation Results - RM 4 to 6  
2002 - 2004**

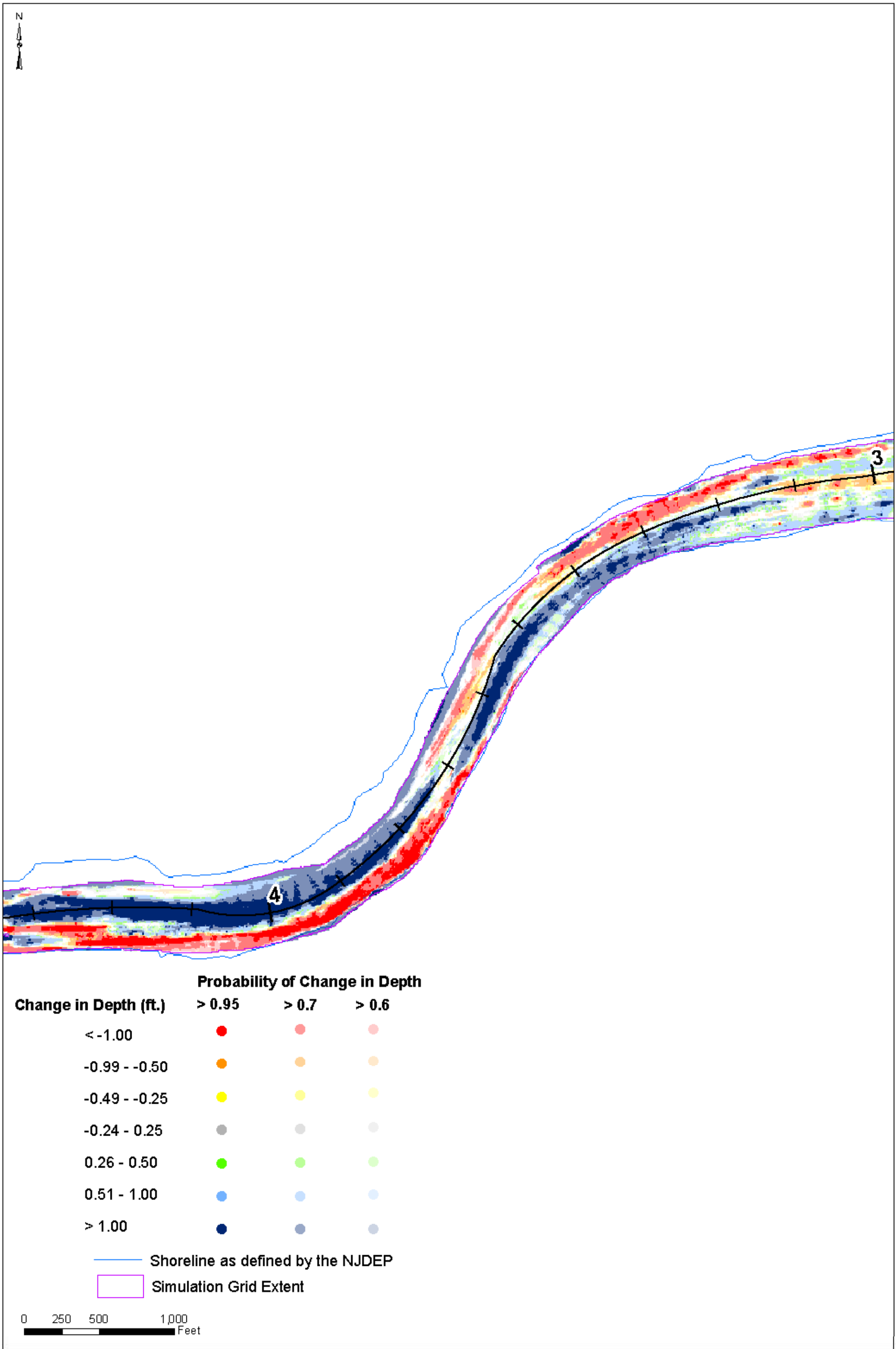
*Lower Passaic River Restoration*

Figure 11-18i

June 2009







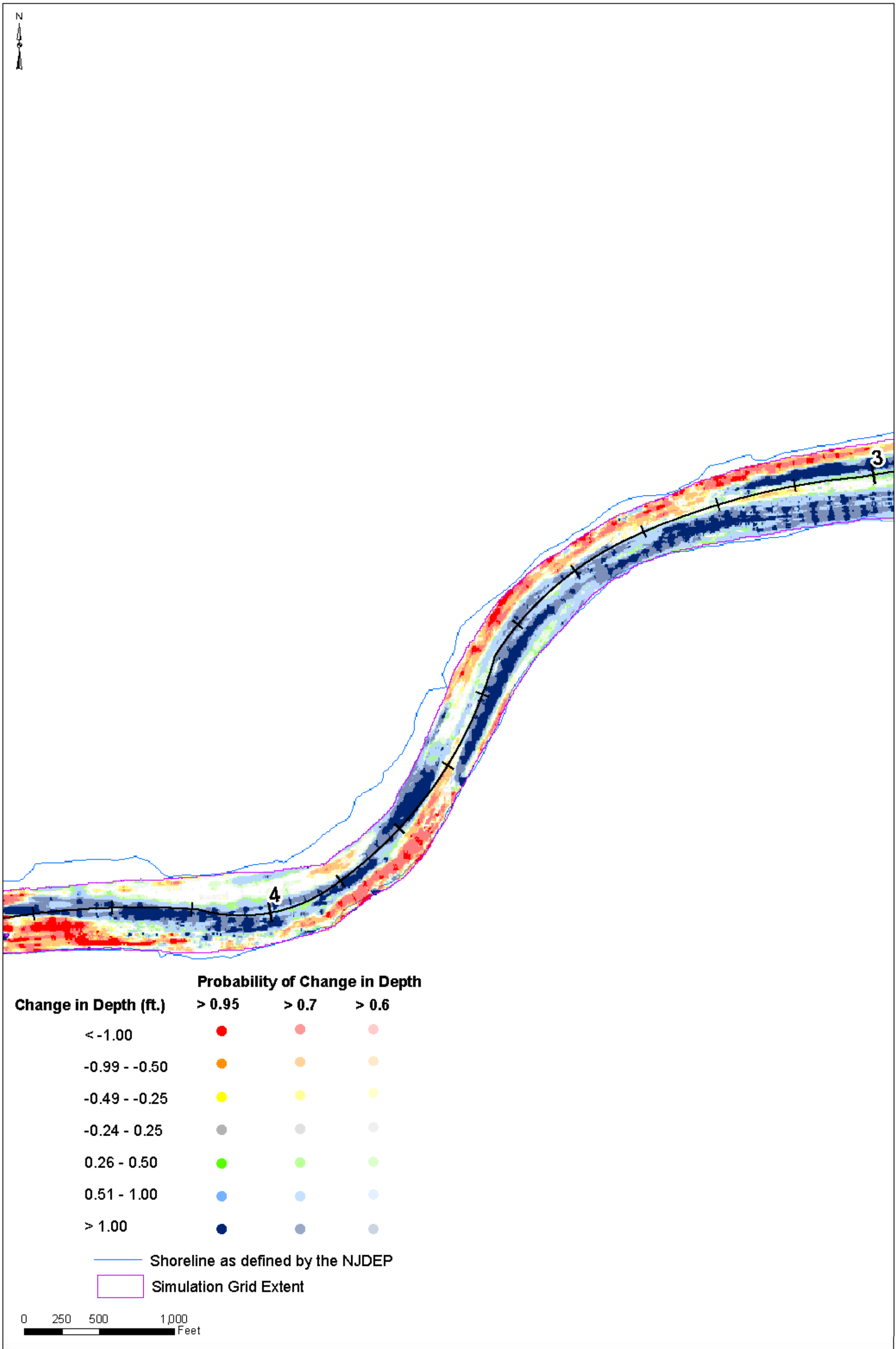
**Conditional Simulation Results - RM 3 to 4**  
**1989 - 2007**

*Lower Passaic River Restoration*

Figure 11-19a

June 2009



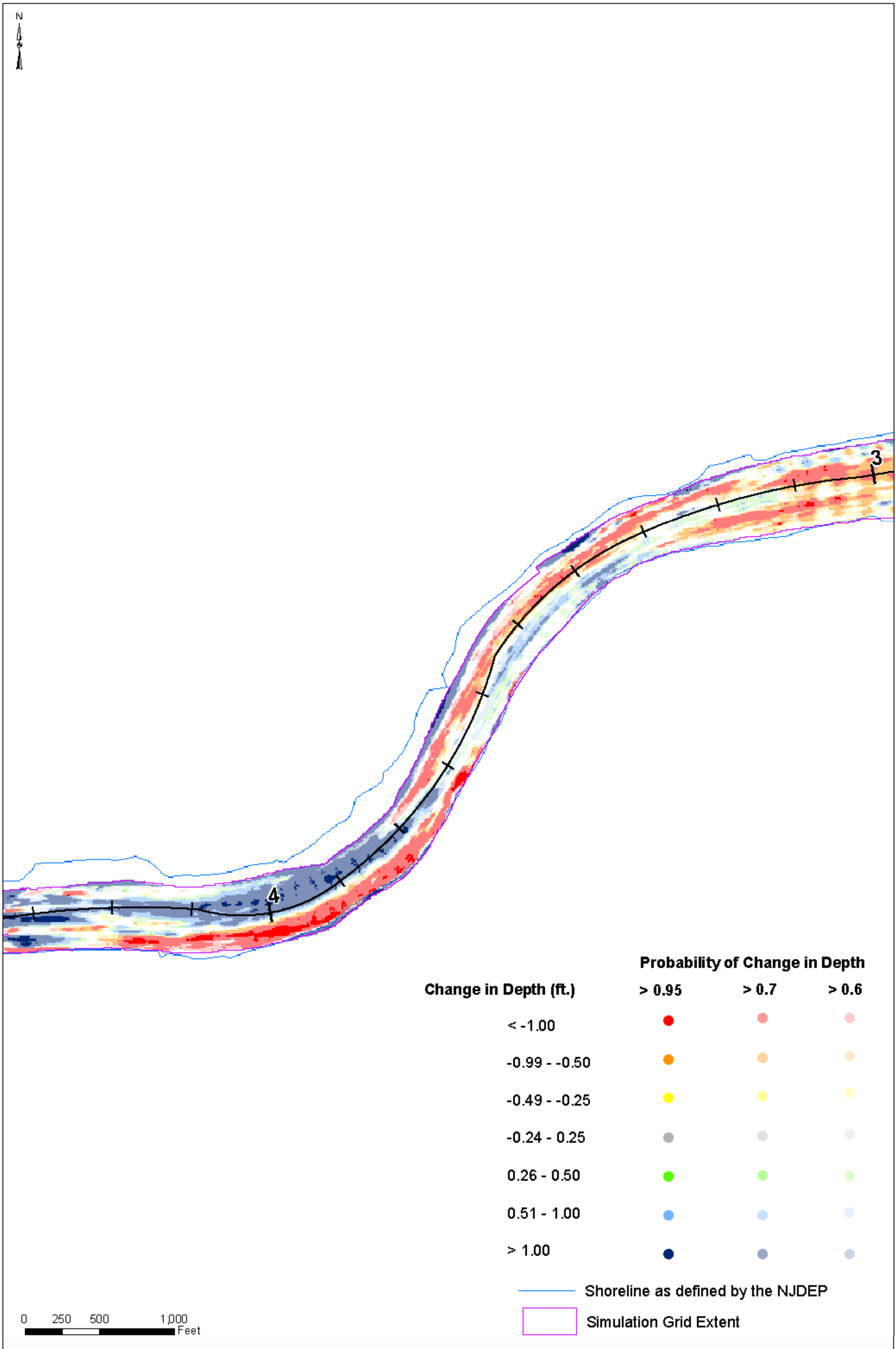


Conditional Simulation Results - RM 3 to 4  
1995 -2007

Figure 11-19b

June 2009



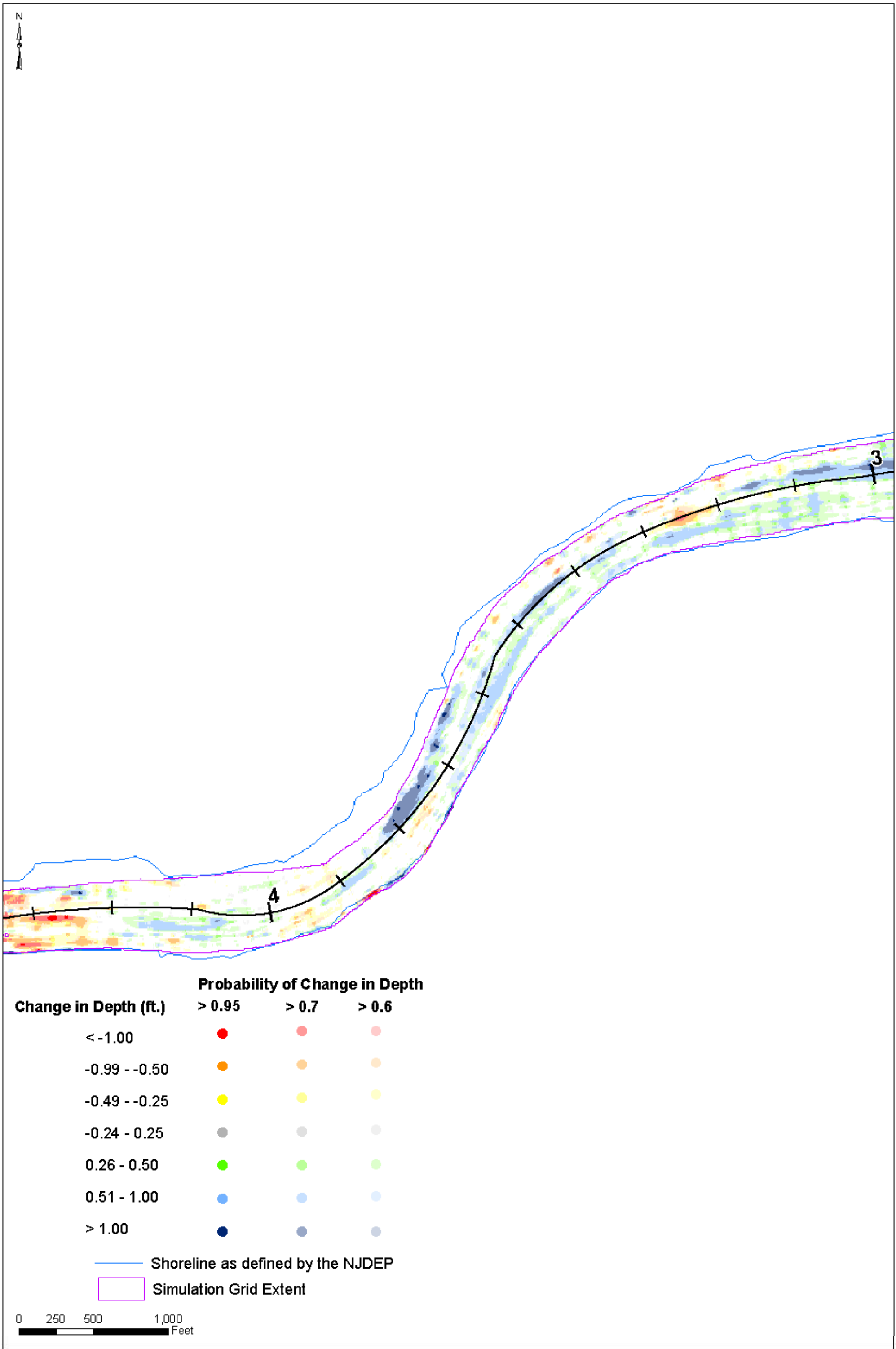


**Conditional Simulation Results - RM 3 to 4**  
**1989 - 1995**

*Lower Passaic River Restoration*

Figure 11-19c

June 2009

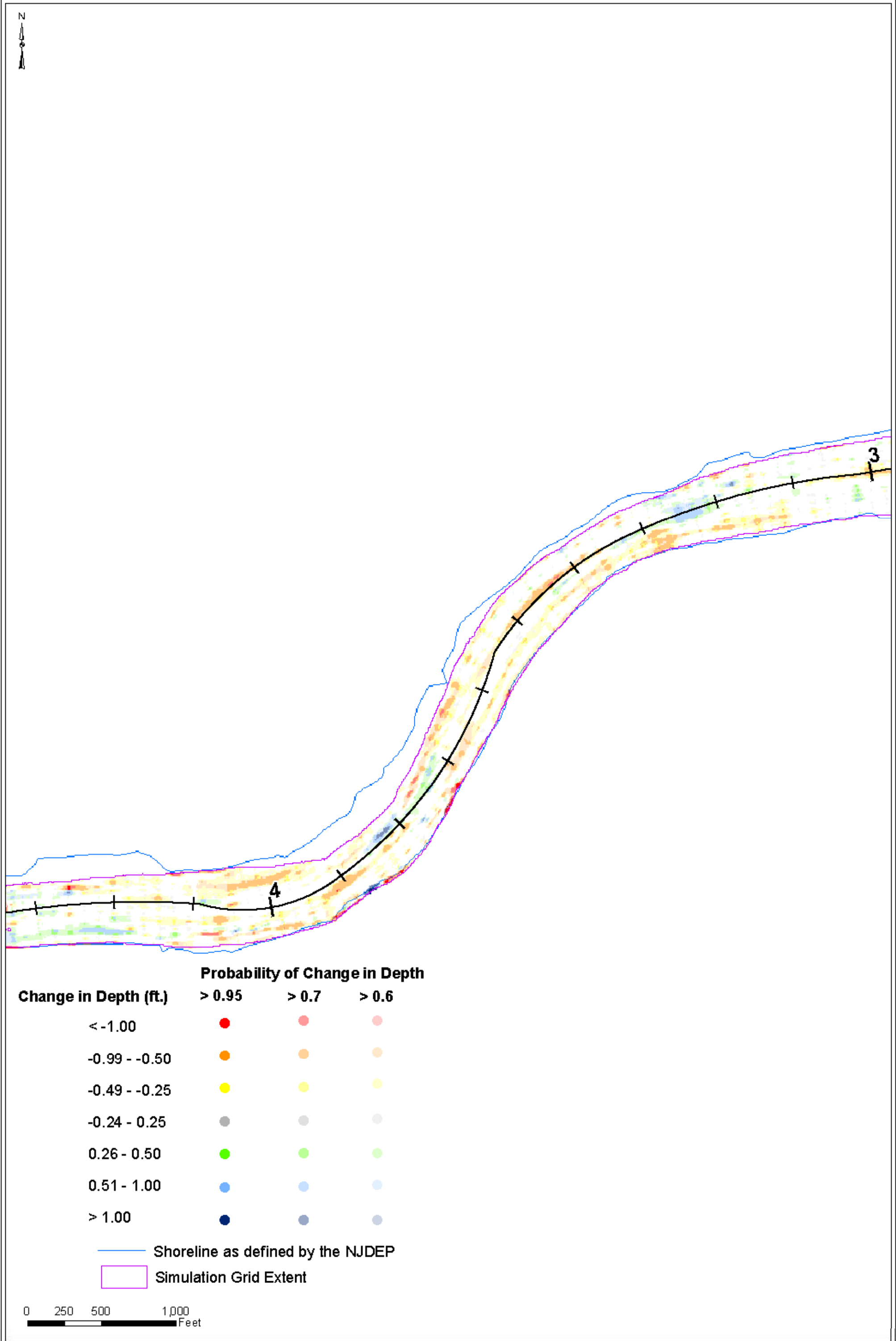


Conditional Simulation Results - RM 3 to 4  
1995 -1996

Figure 11-19d

June 2009



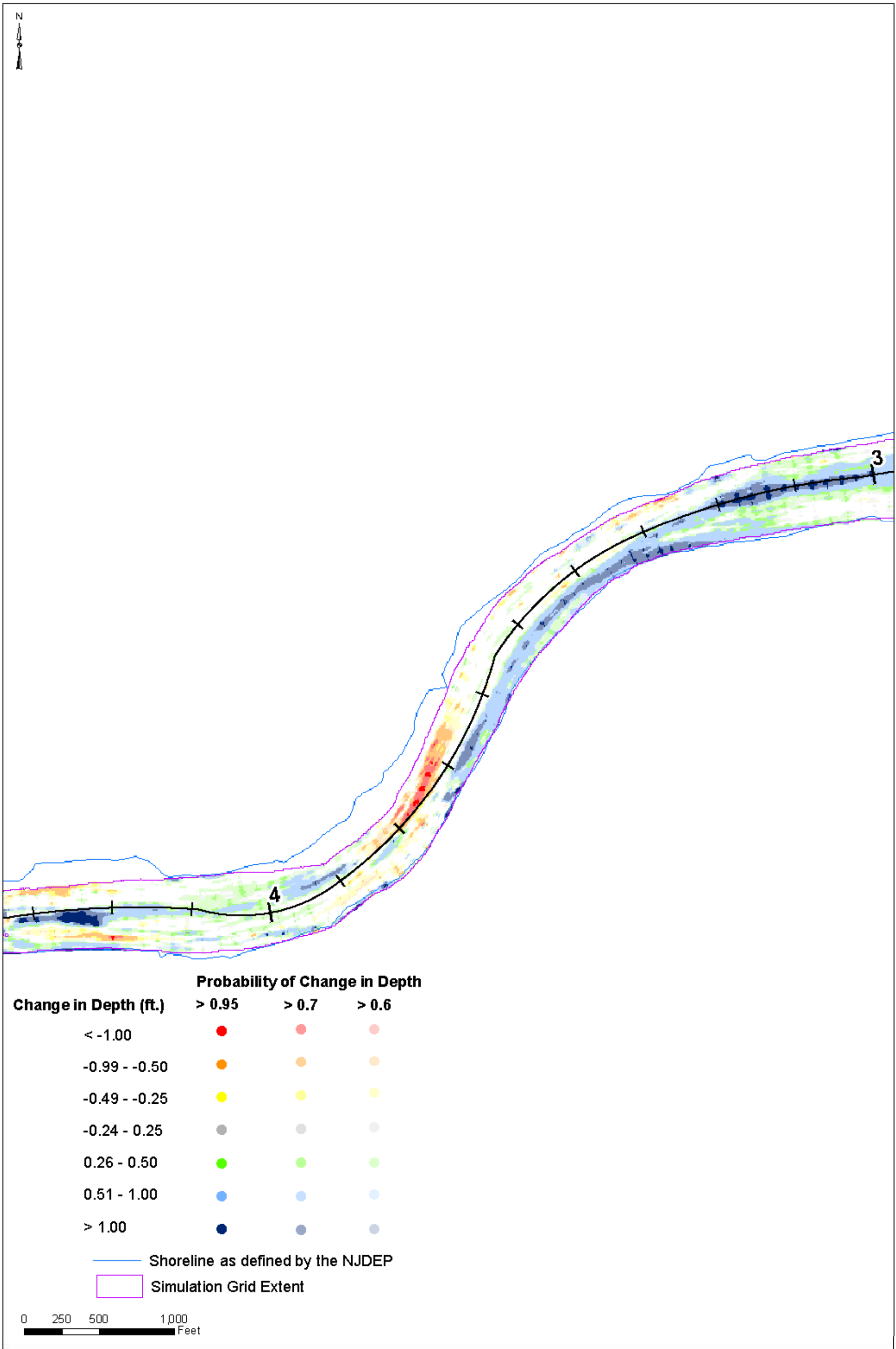


**Conditional Simulation Results - RM 3 to 4  
1996 - 1997**

Figure 11-19e

June 2009





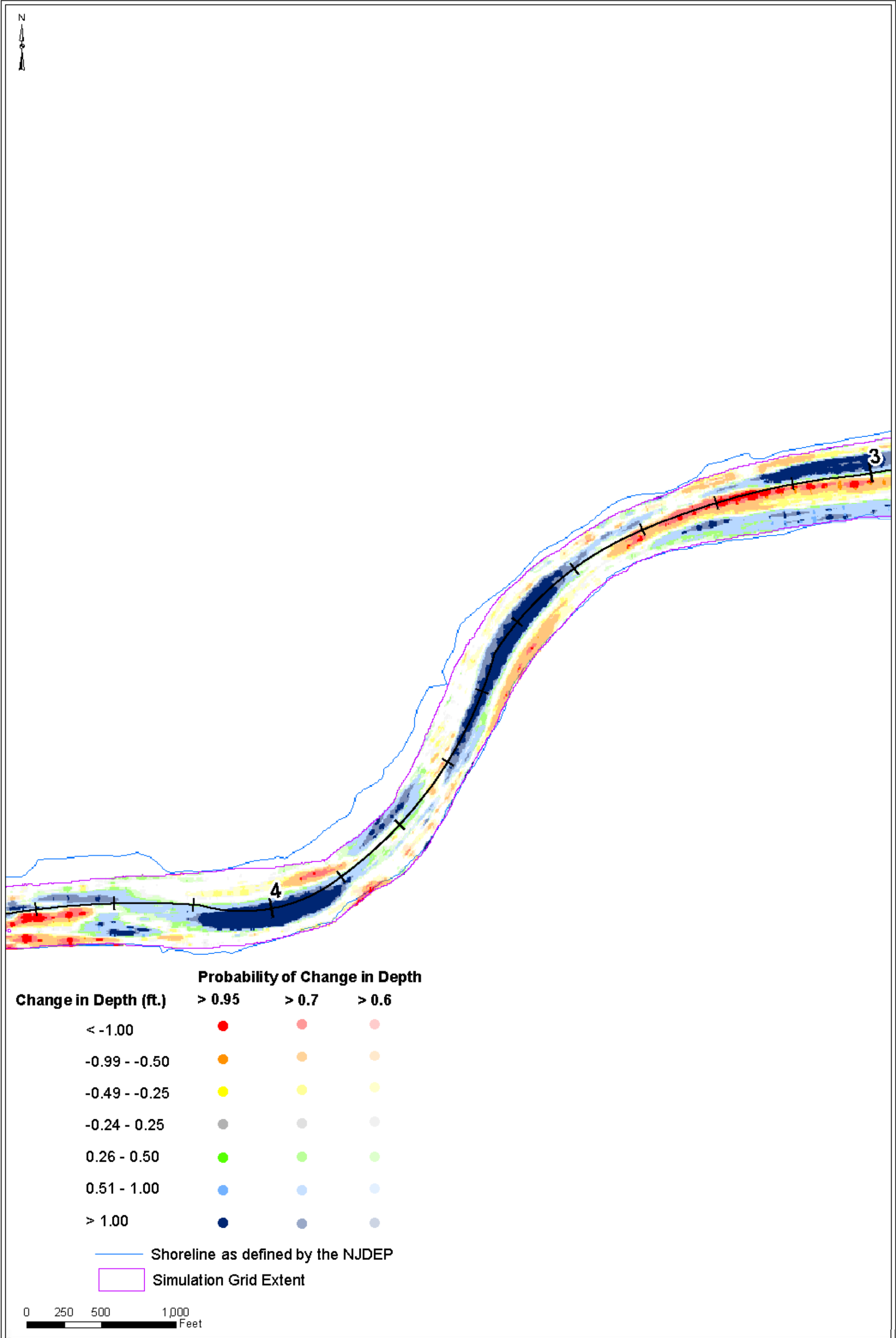
**Conditional Simulation Results - RM 3 to 4**  
**1997 - 1999**

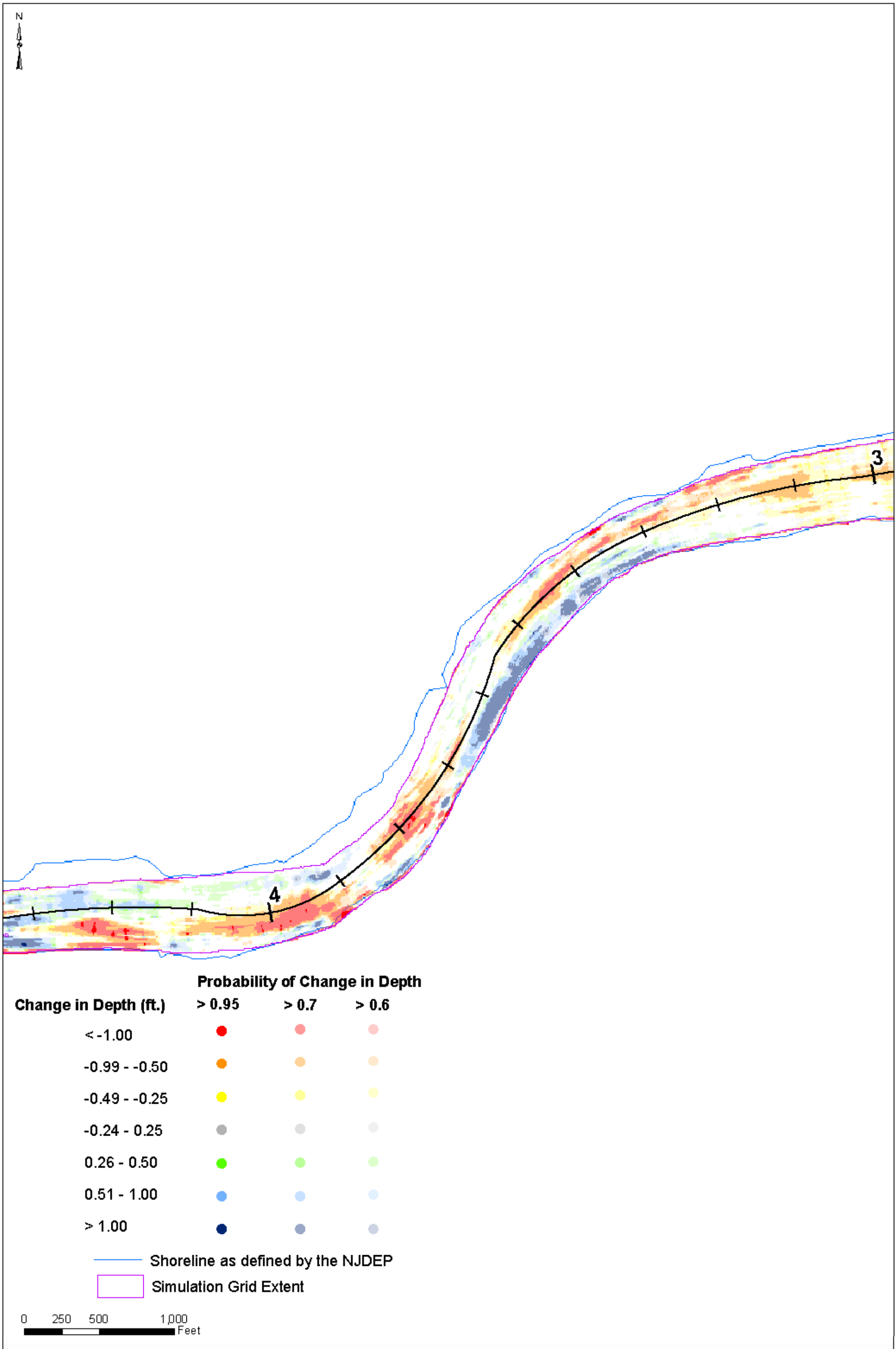
*Lower Passaic River Restoration*

Figure 11-19f

June 2009





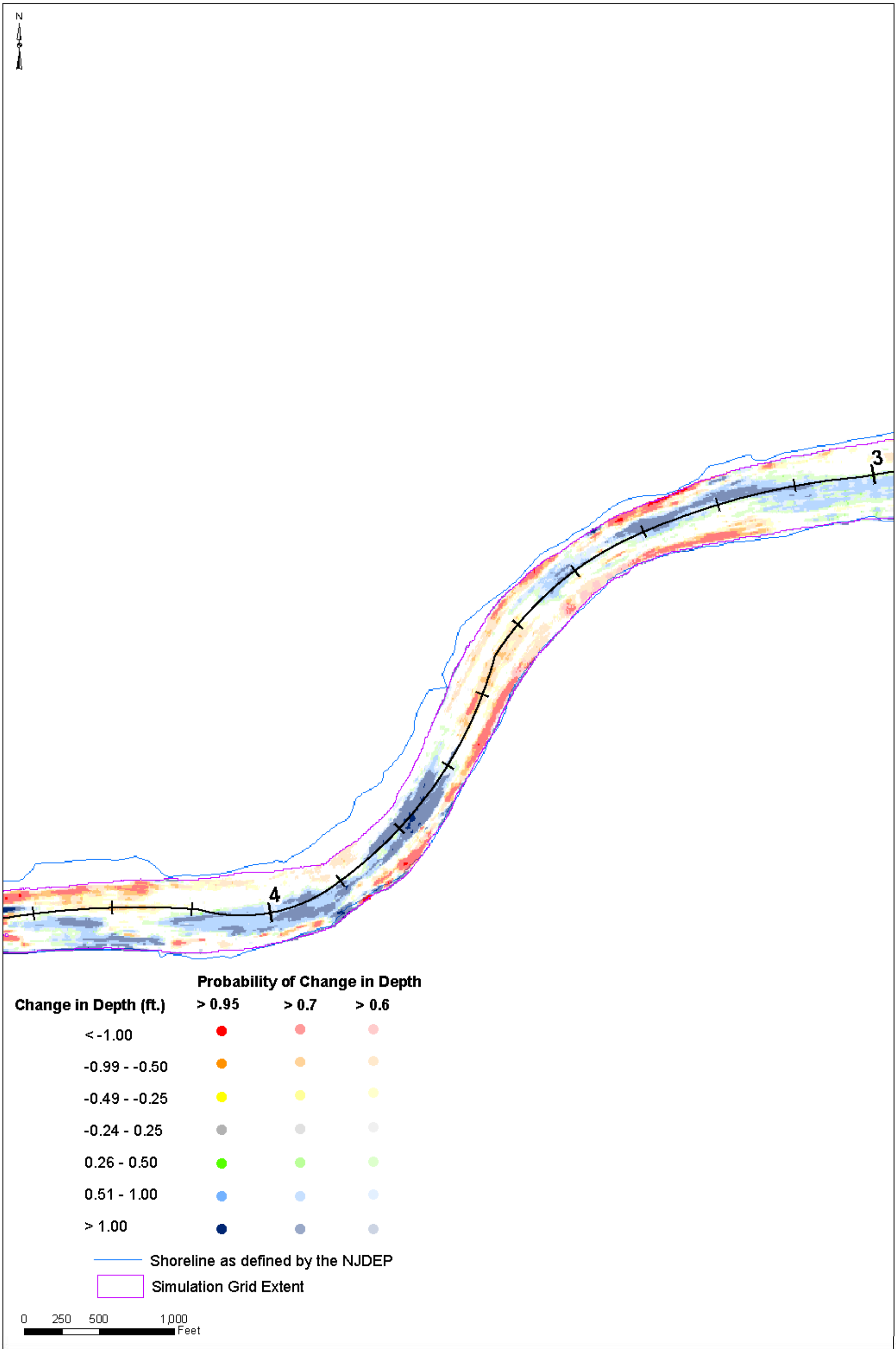


Conditional Simulation Results - RM 3 to 4  
2001 - 2002

Figure 11-19h

June 2009



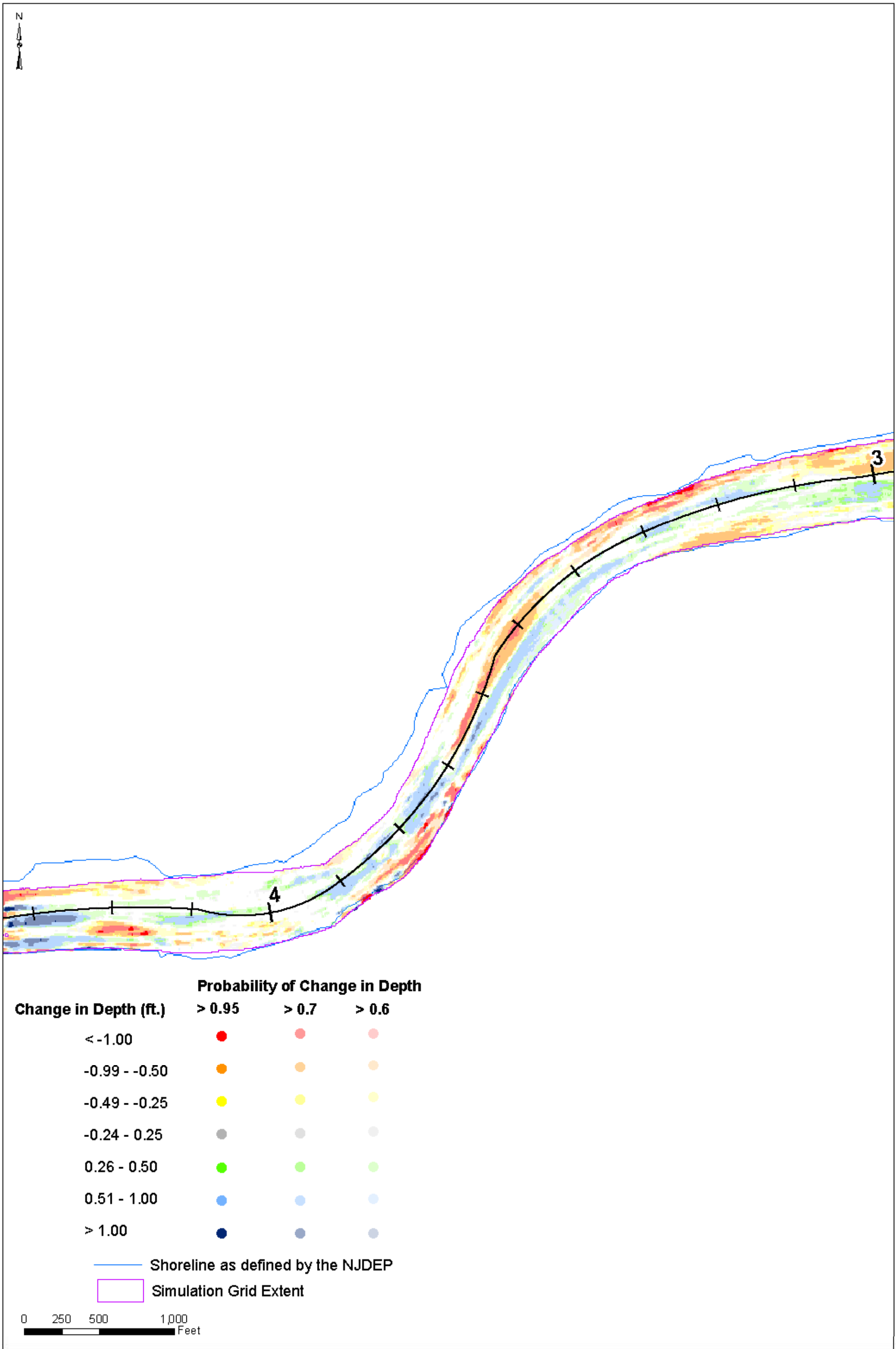


Conditional Simulation Results - RM 3 to 4  
2002 - 2004

Figure 11-19i

June 2009

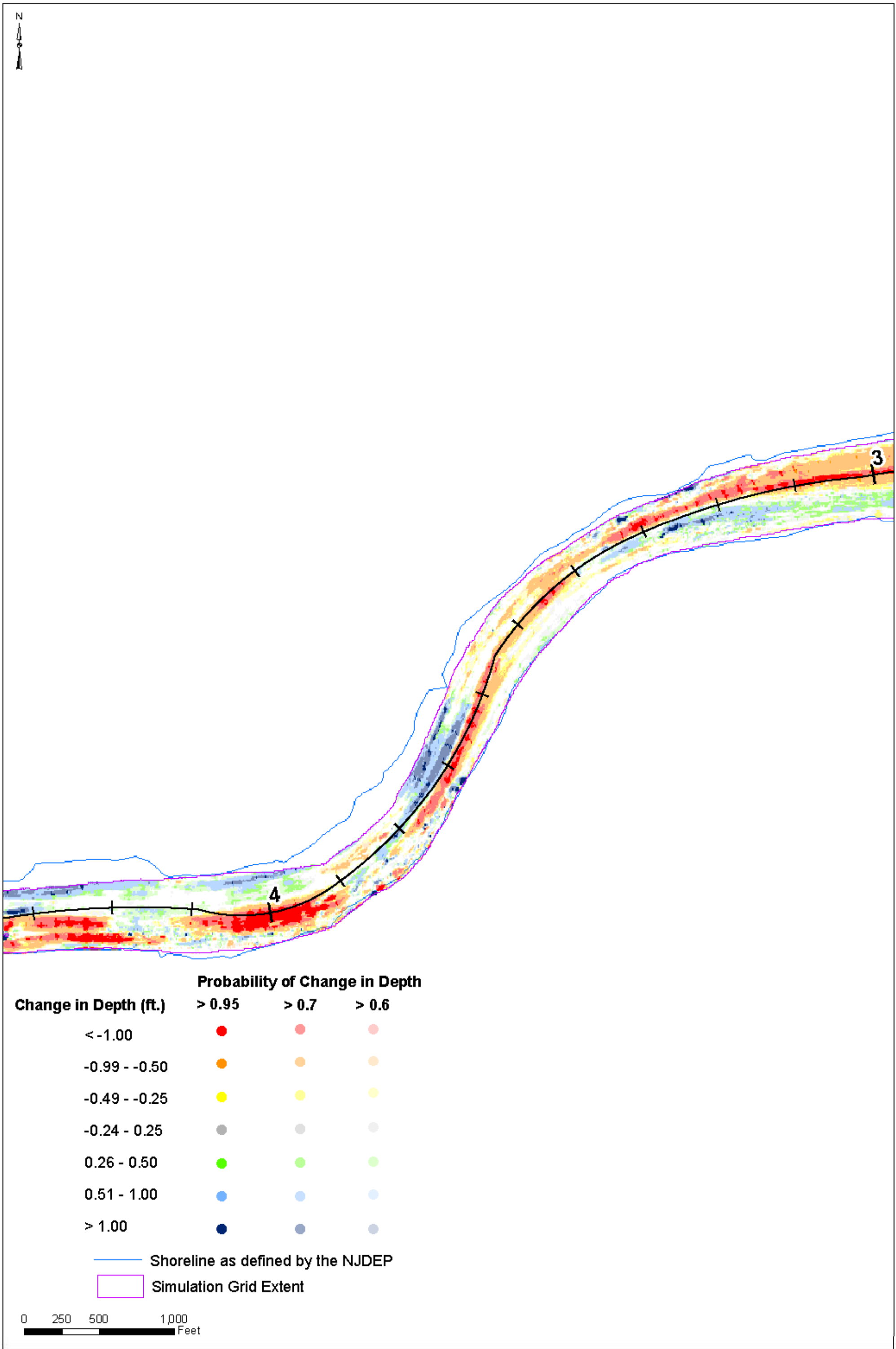




**Conditional Simulation Results - RM 3 to 4**  
**2001 - 2004**

Figure 11-19j

June 2009



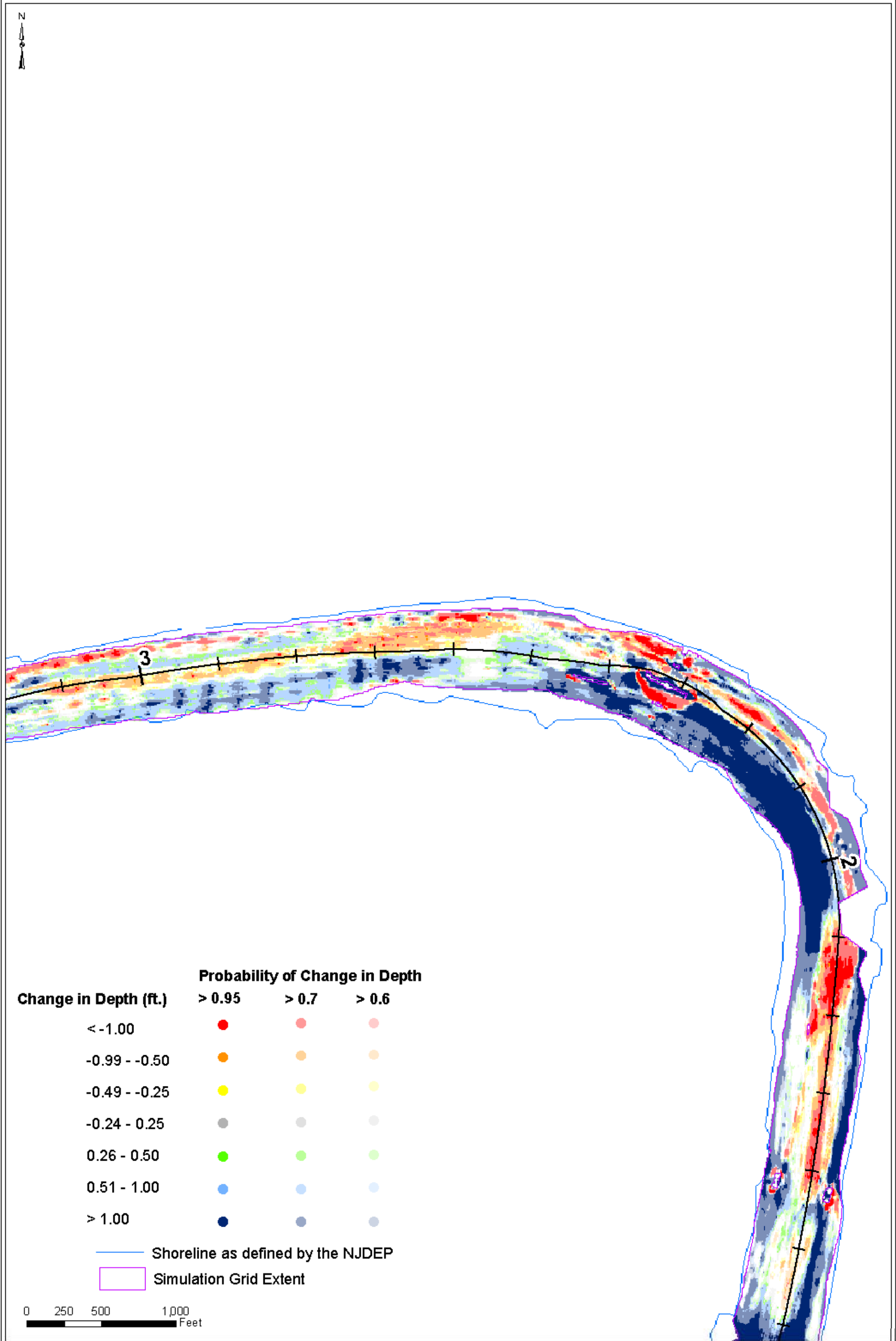
**Conditional Simulation Results - RM 3 to 4**  
**2004 - 2007**

*Lower Passaic River Restoration*

Figure 11-19k

June 2009



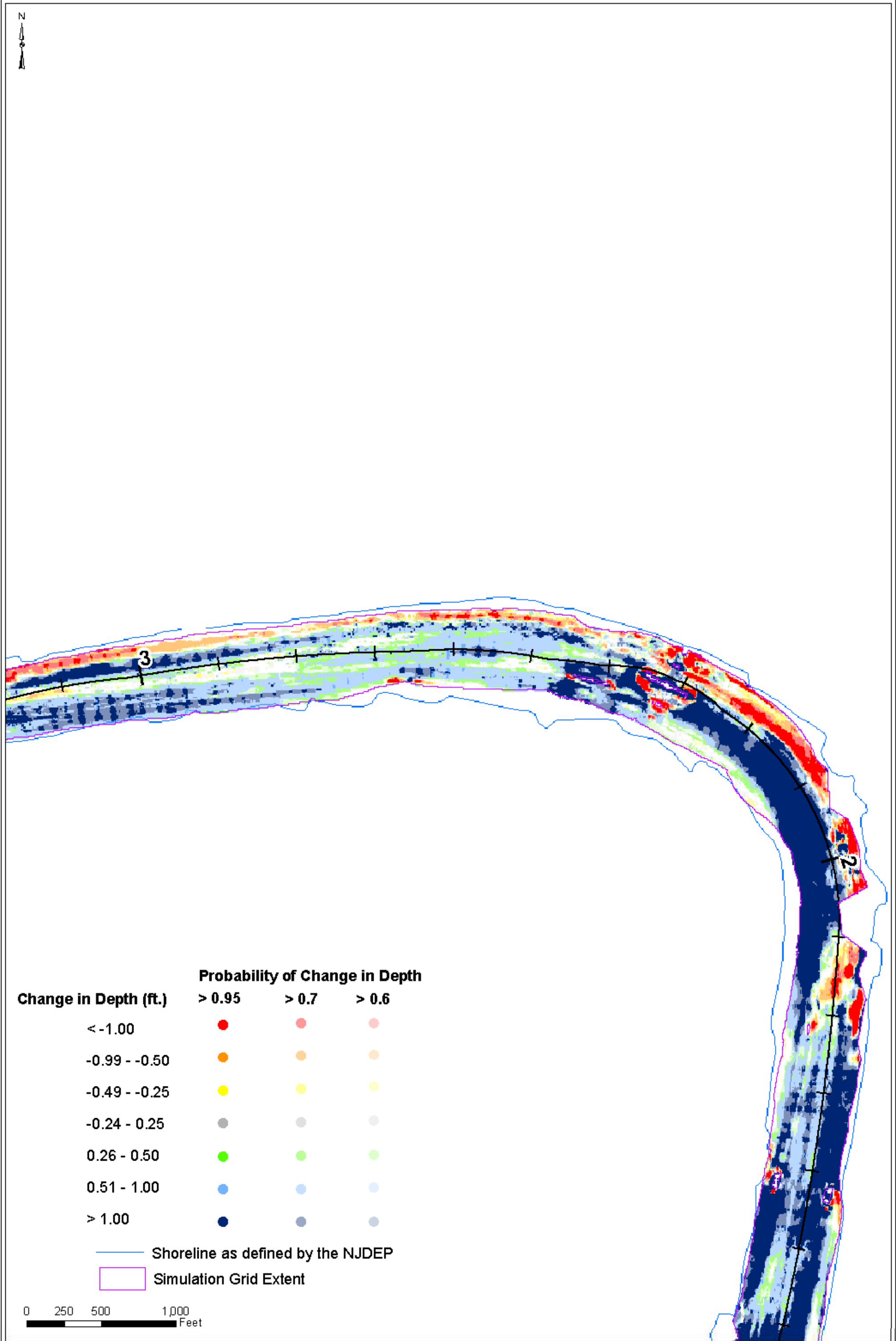


**Conditional Simulation Results - RM 2 to 3  
 1989 - 2007**

**Figure 11-20a**

**June 2009**



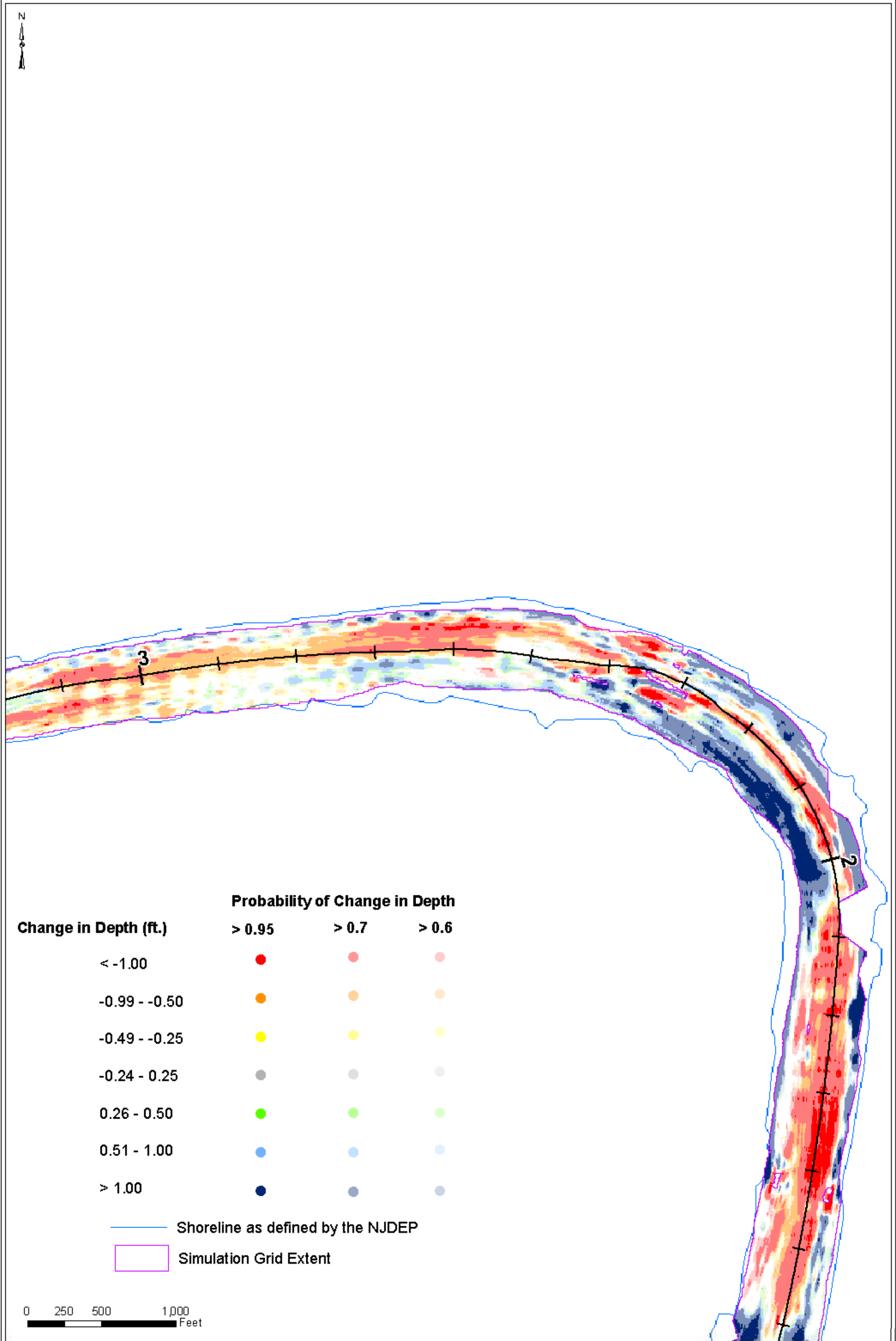


**Conditional Simulation Results - RM 2 to 3  
1995 -2007**

**Figure 11-20b**

**June 2009**



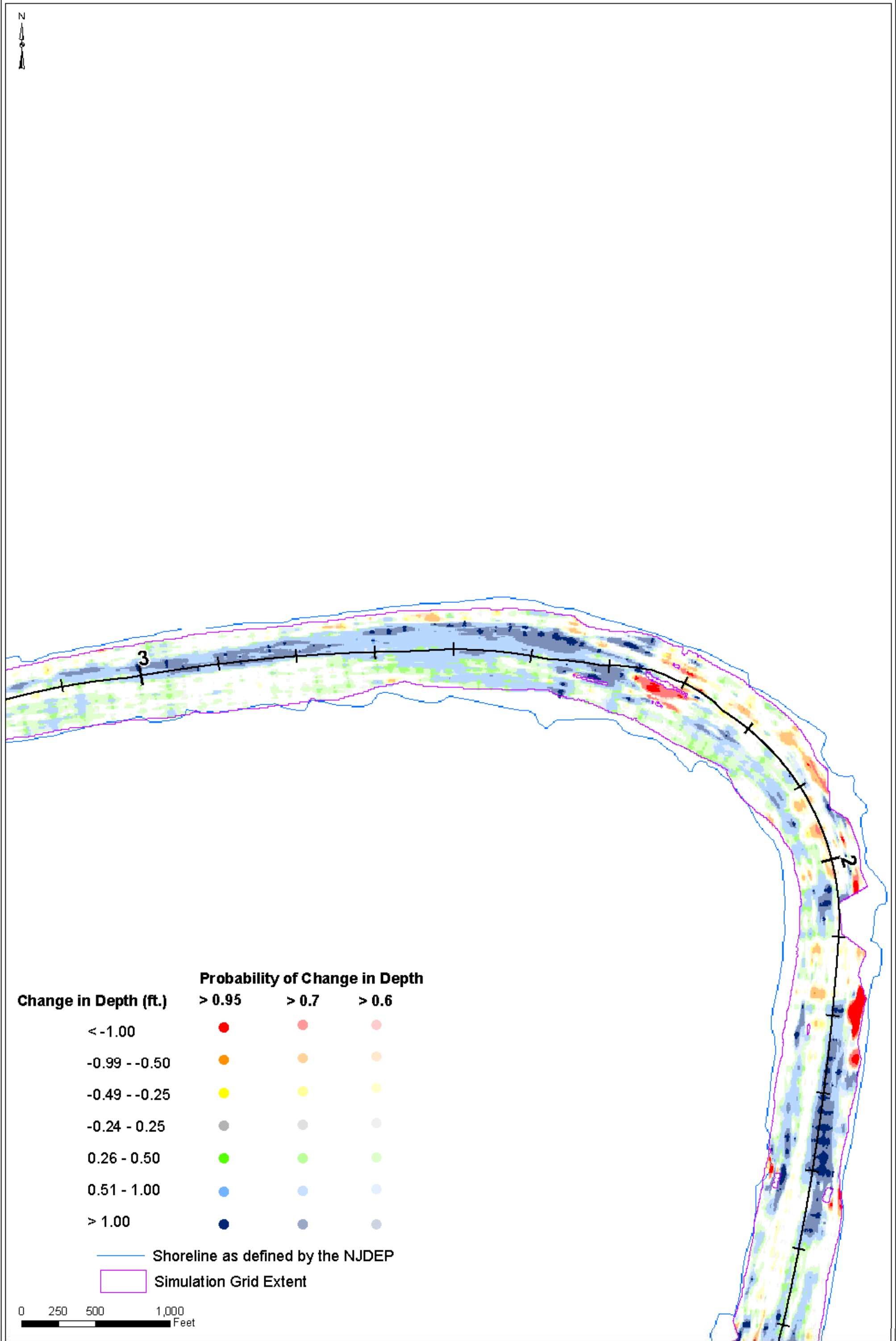


Conditional Simulation Results - RM 2 to 3  
1989 - 1995

Figure 11-20c

June 2009



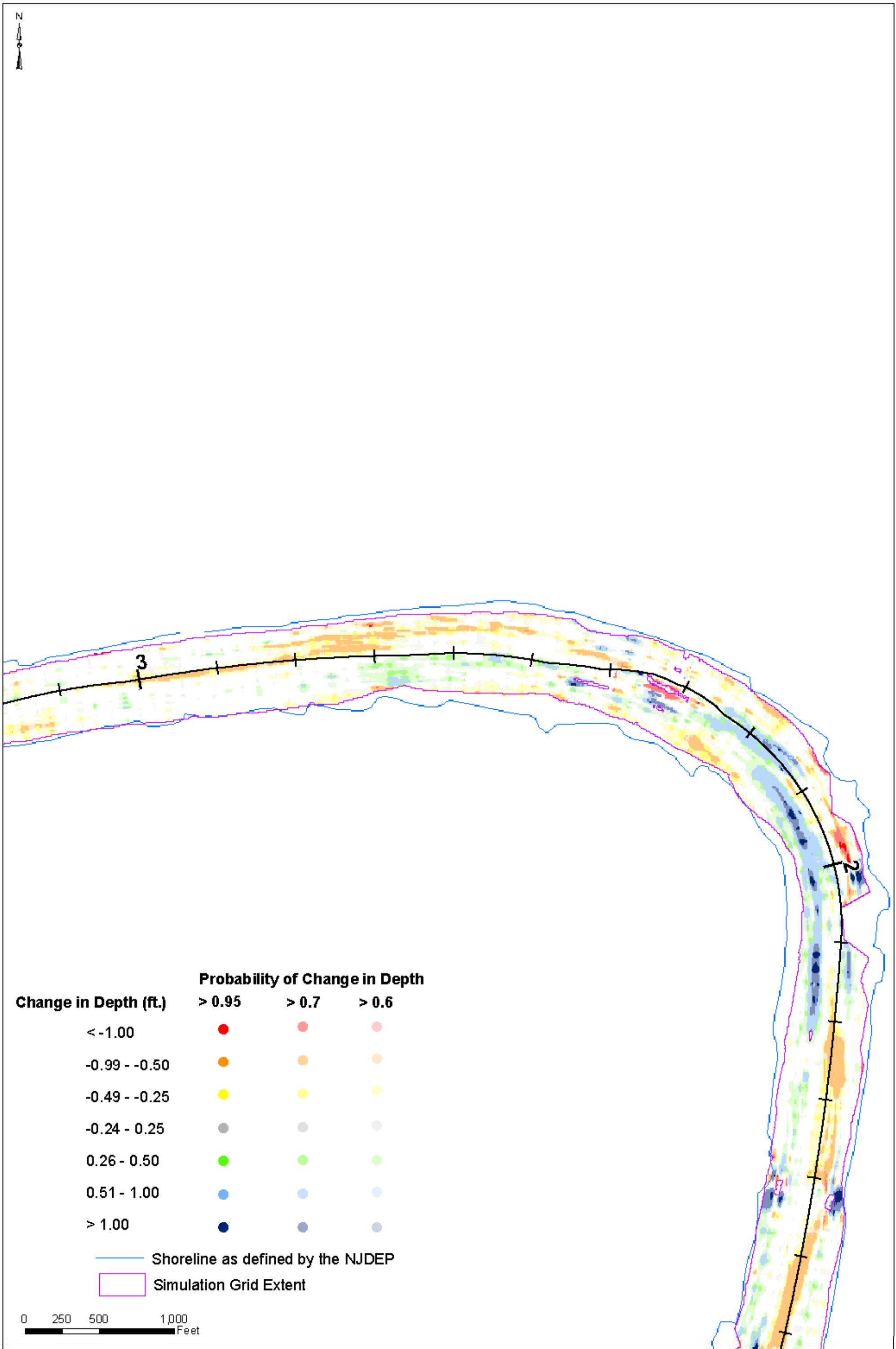


**Conditional Simulation Results - RM 2 to 3**  
**1995 - 1996**

Figure 11-20d

June 2009



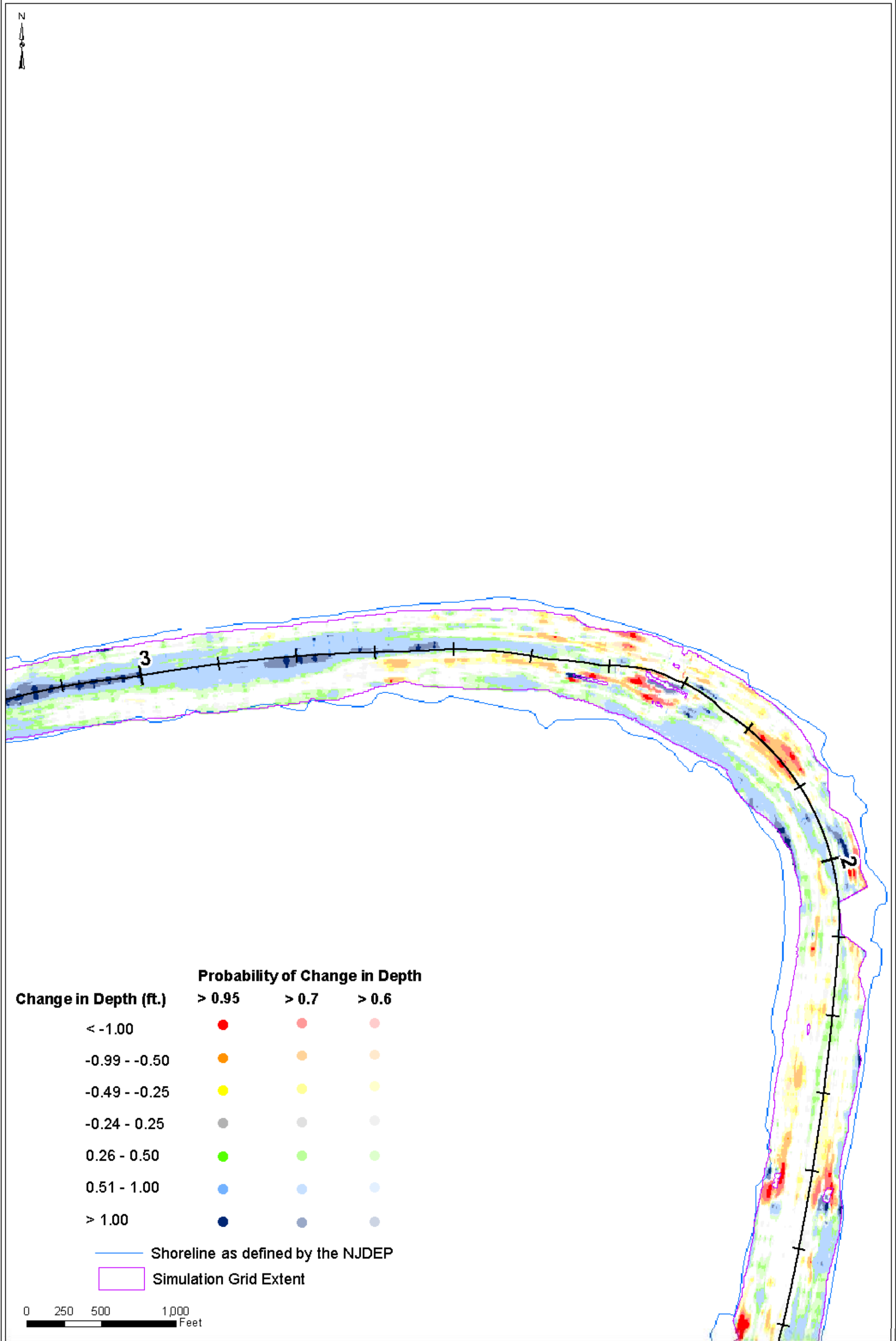


**Conditional Simulation Results - RM 2 to 3**  
**1996 - 1997**

Figure 11-20e

June 2009



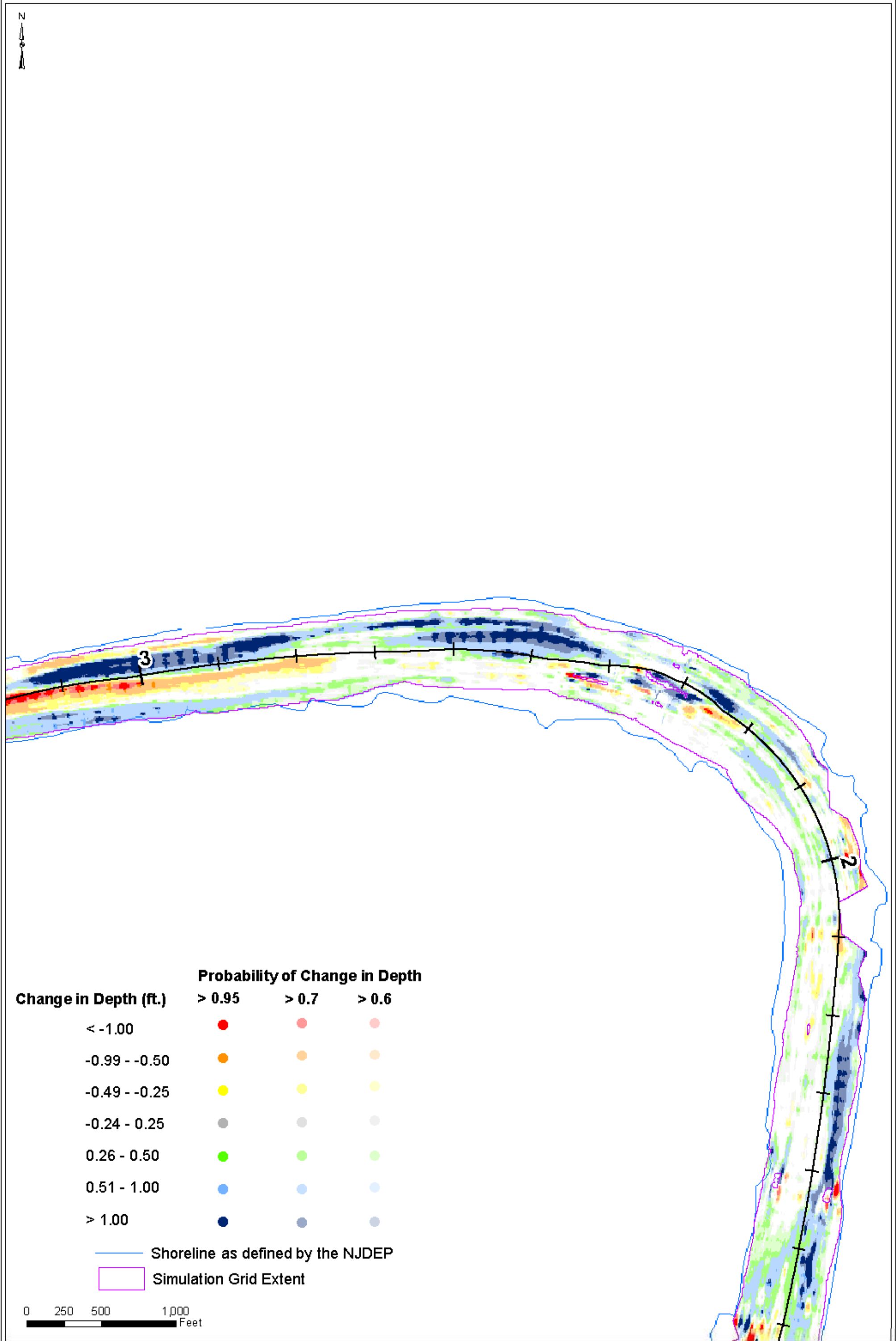


**Conditional Simulation Results - RM 2 to 3  
 1997 - 1999**

**Figure 11-20f**

**June 2009**



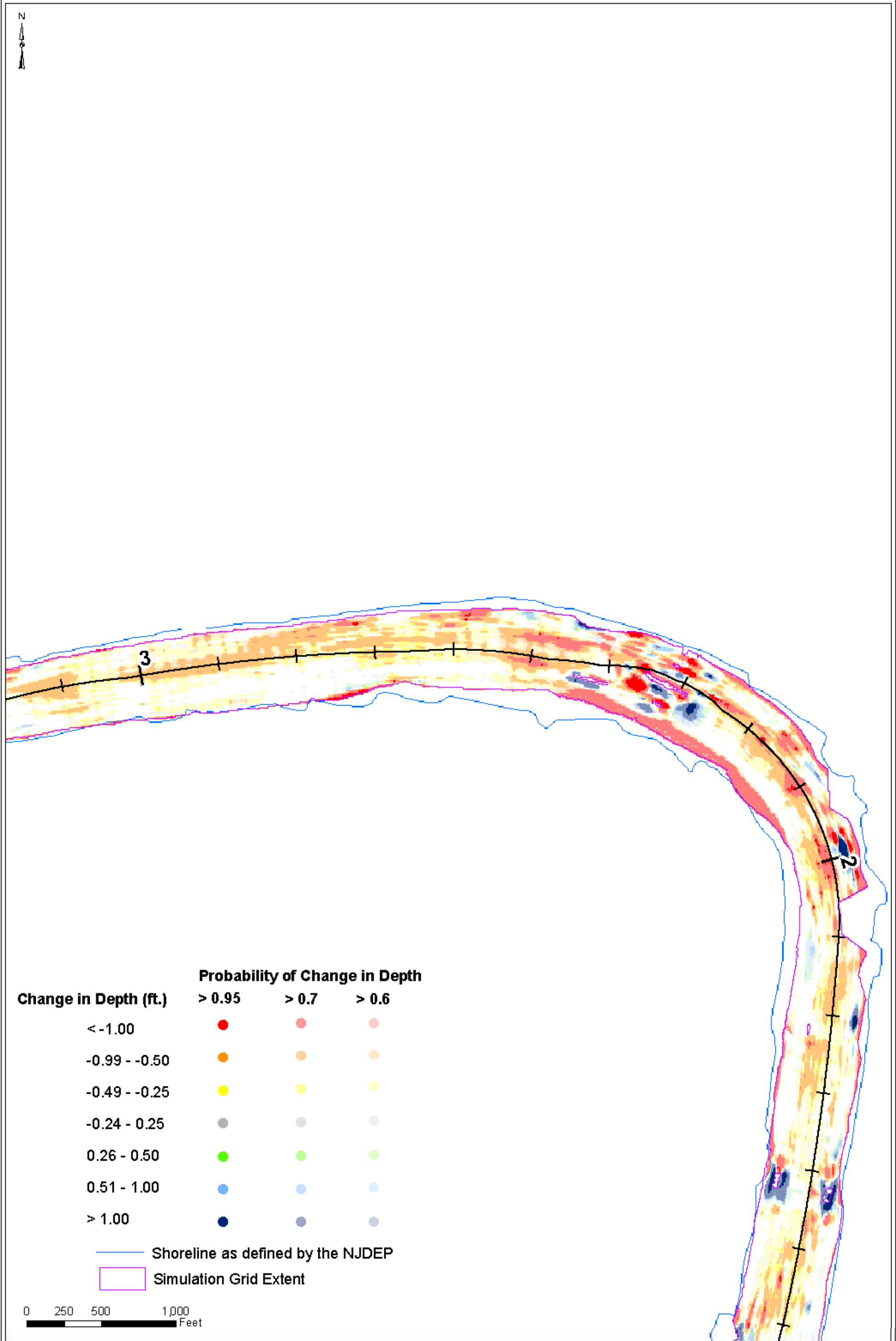


**Conditional Simulation Results - RM 2 to 3  
1999 - 2001**

**Figure 11-20g**

**June 2009**



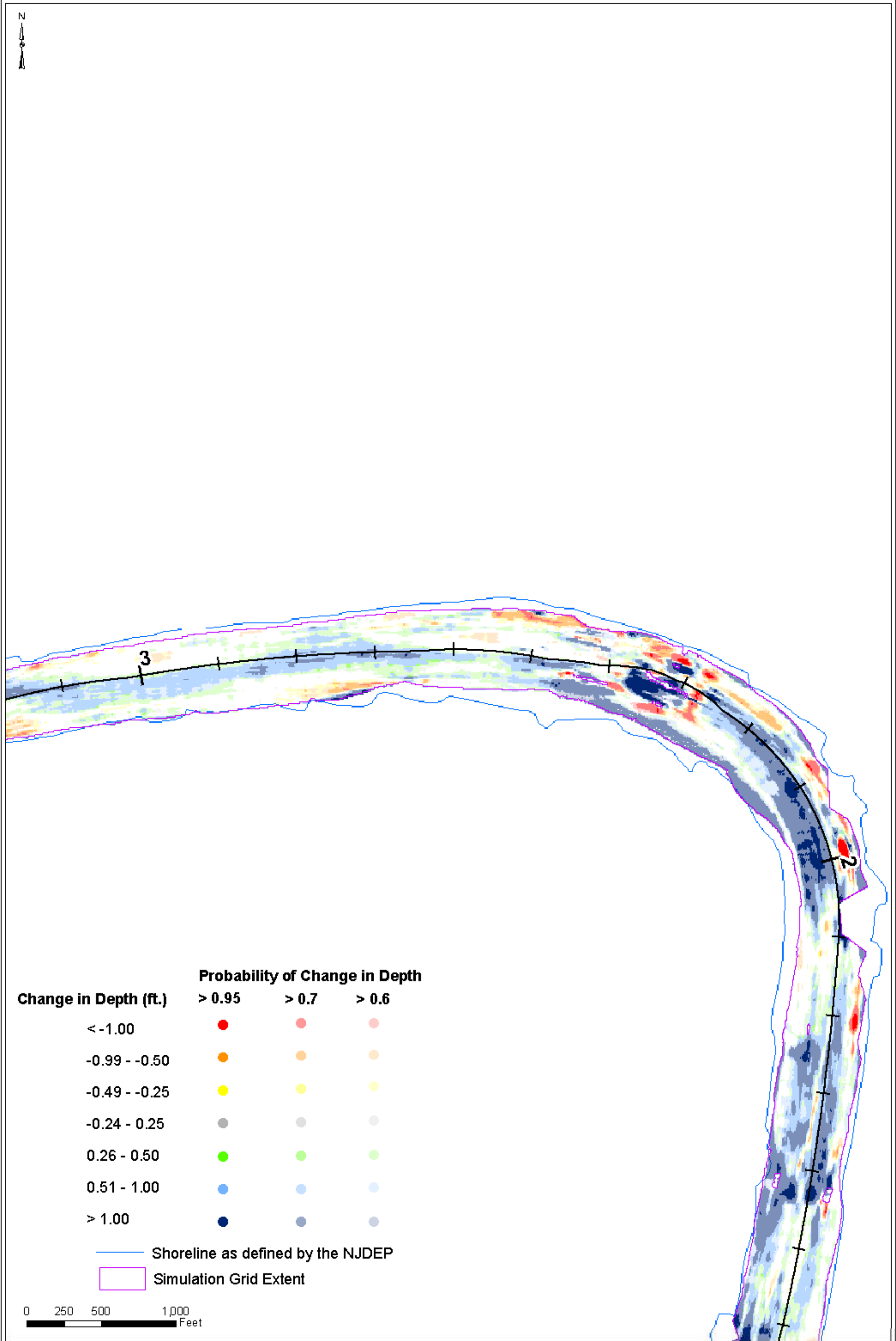


**Conditional Simulation Results - RM 2 to 3**  
**2001 - 2002**

Figure 11-20h

June 2009



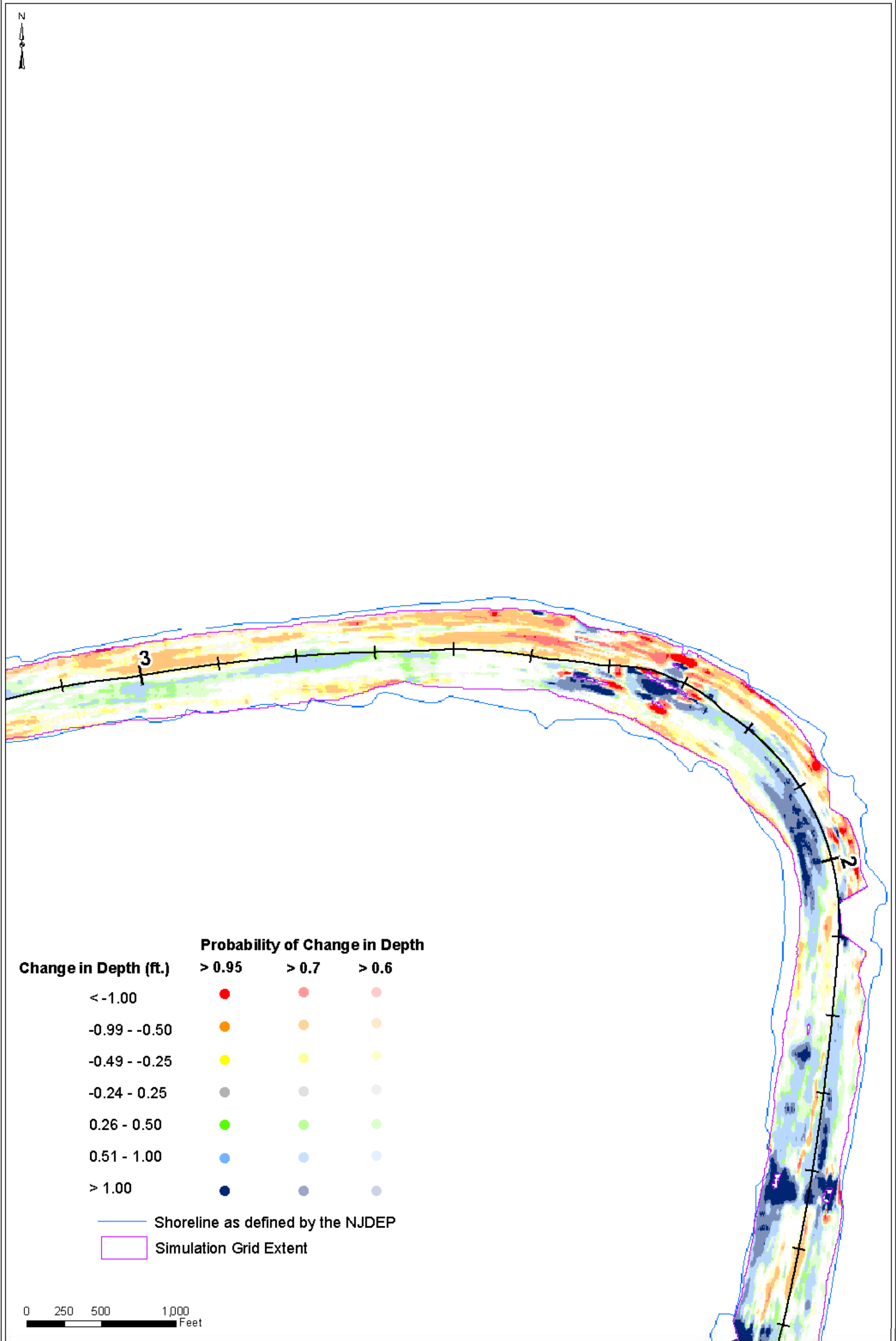


Conditional Simulation Results - RM 2 to 3  
2002 - 2004

Figure 11-20i

June 2009





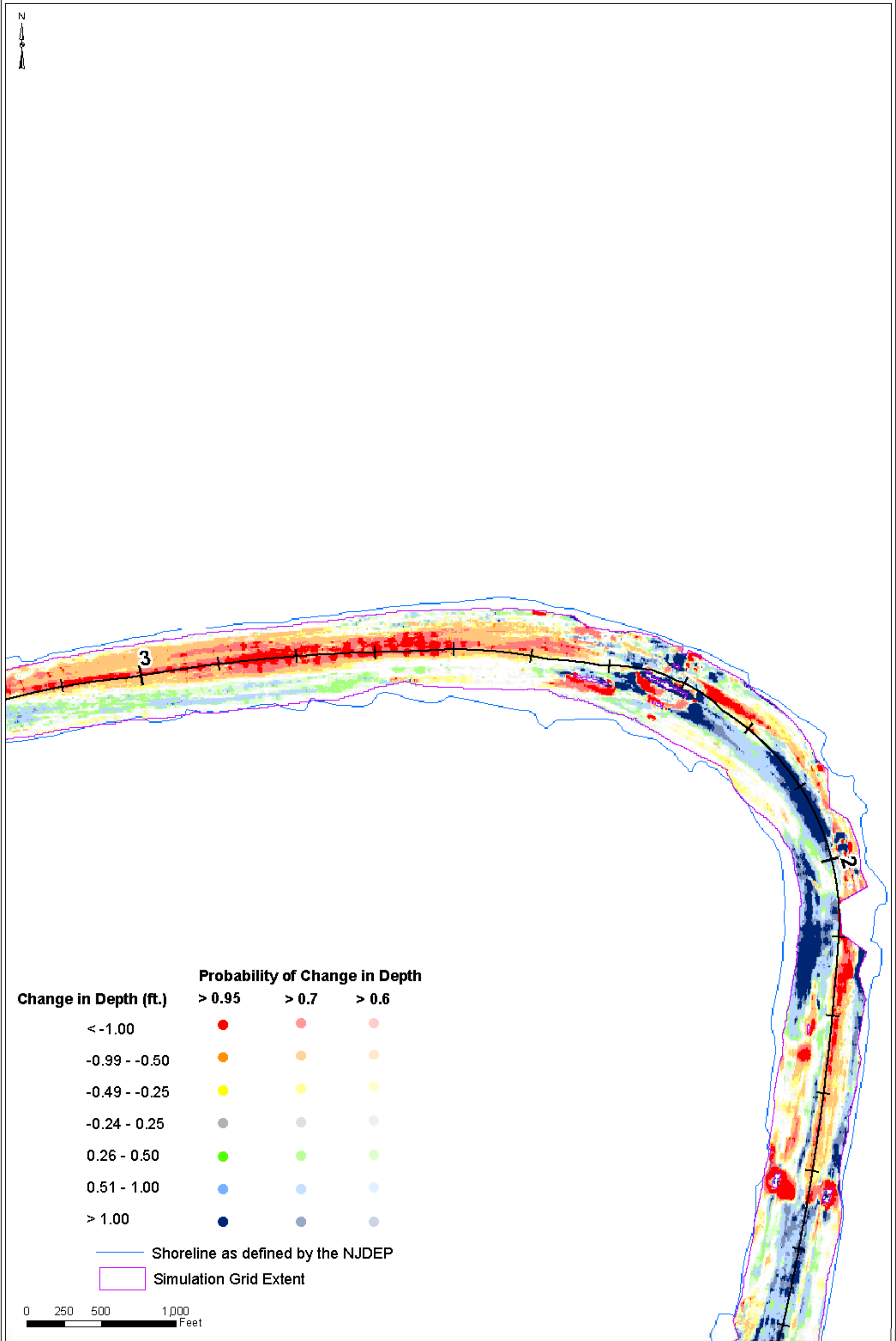
**Conditional Simulation Results - RM 2 to 3  
 2001 - 2004**

**Figure 11-20j**

**June 2009**





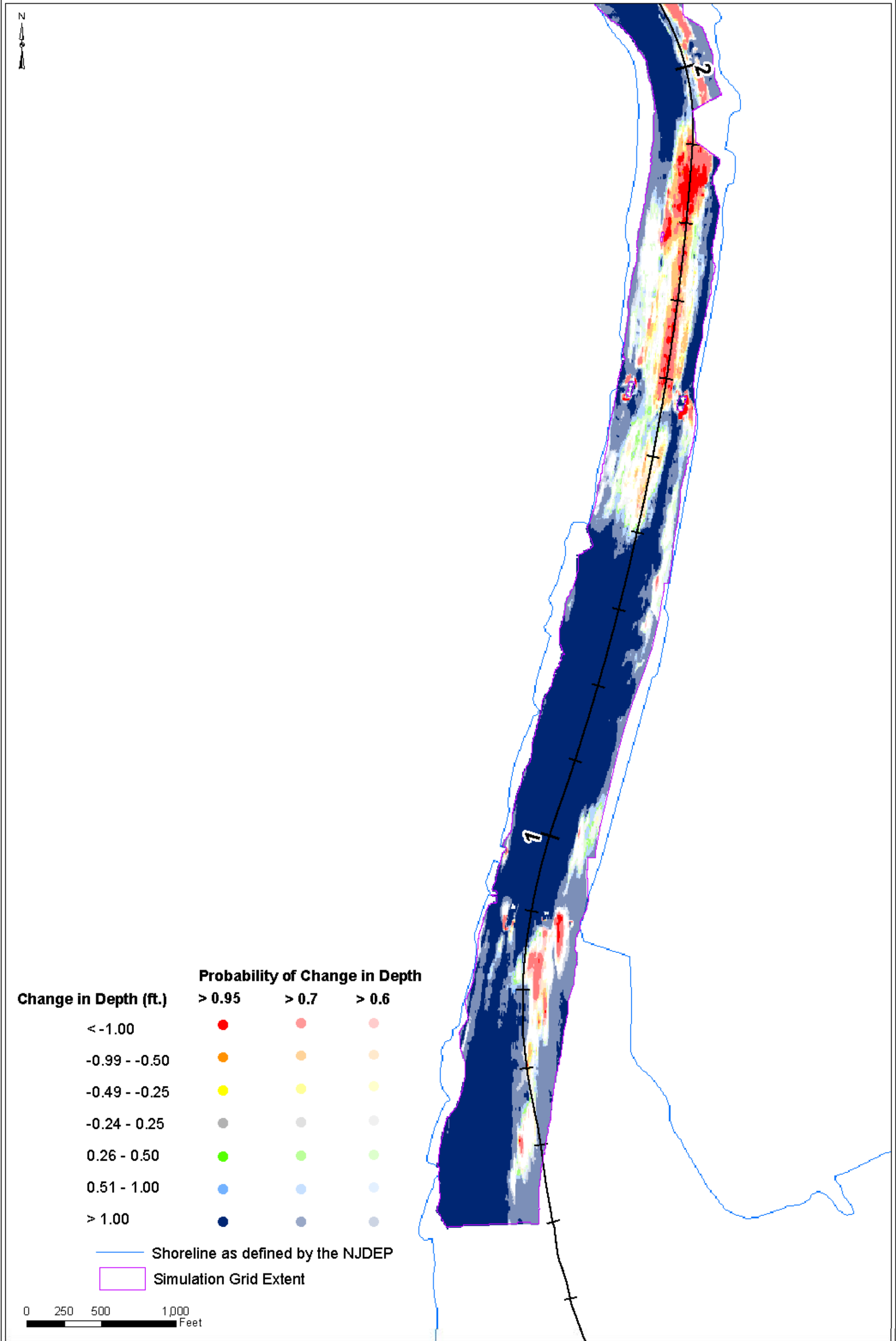


**Conditional Simulation Results - RM 2 to 3**  
**2004 - 2007**

*Lower Passaic River Restoration*

**Figure 11-20k**  
**June 2009**

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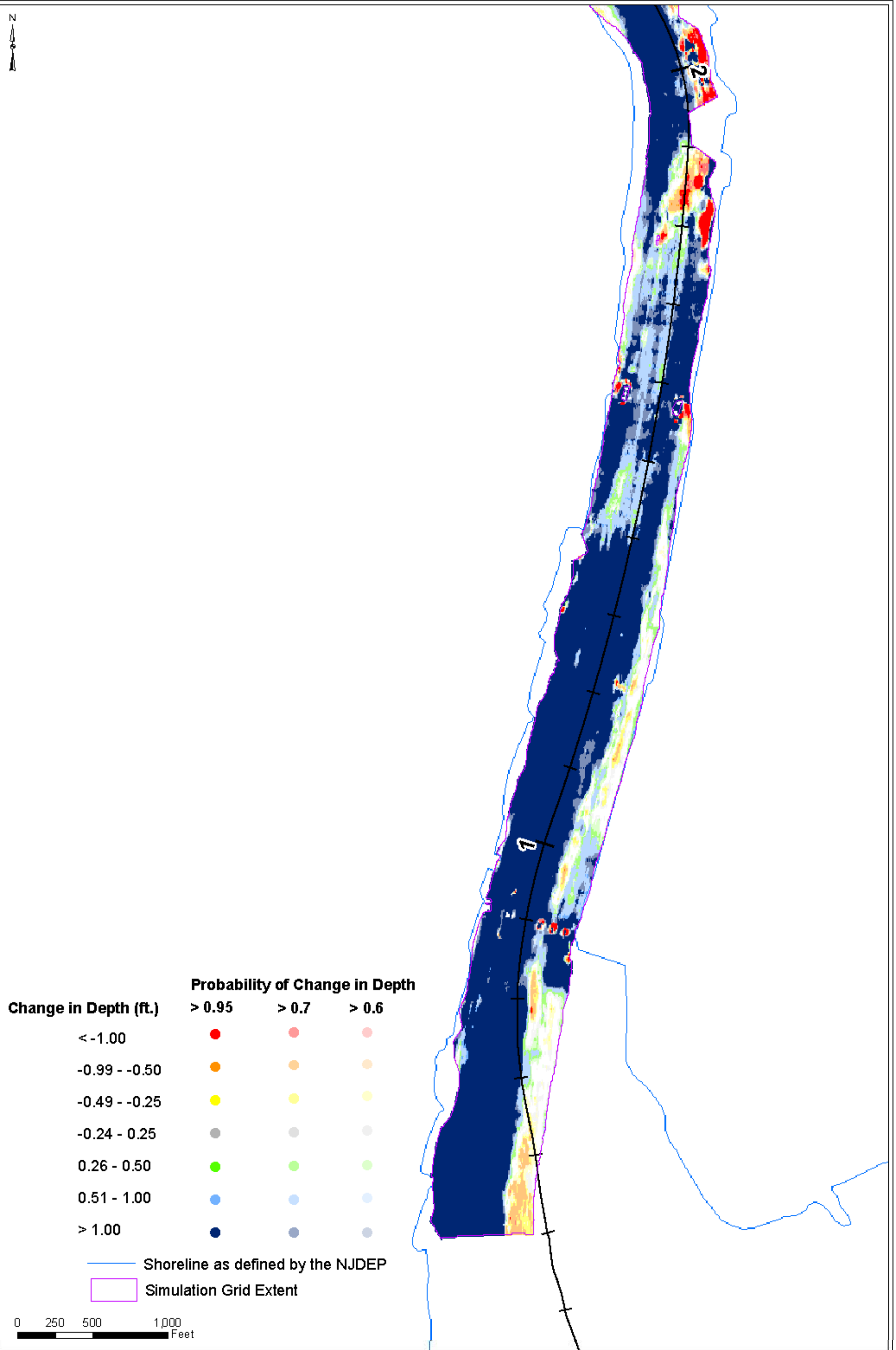
**Conditional Simulation Results - RM 0.5 to 2**  
**1989 - 2007**

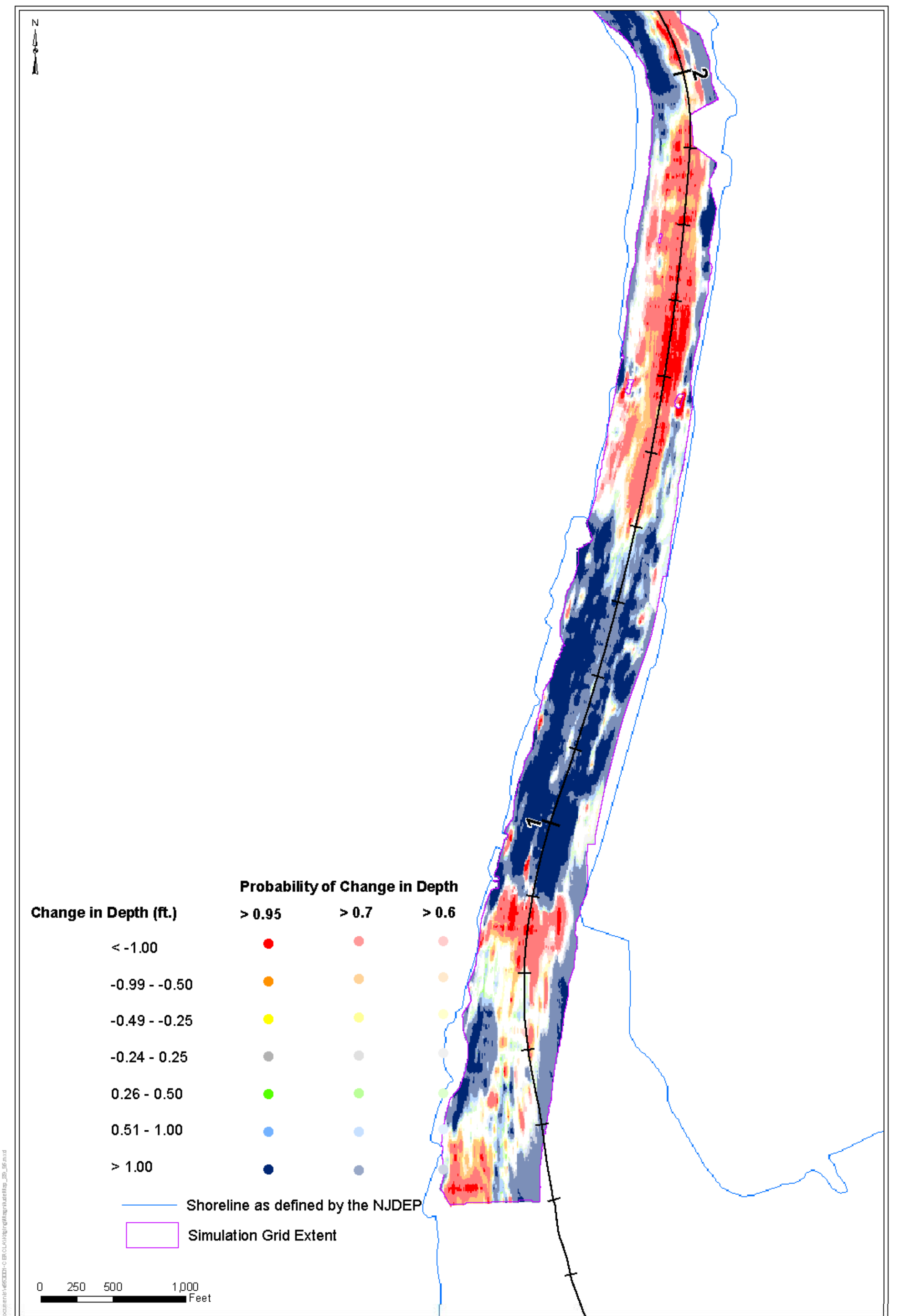
*Lower Passaic River Restoration*

Figure 11-21a

June 2009







Change in Depth (ft.)	Probability of Change in Depth		
	> 0.95	> 0.7	> 0.6
< -1.00			
-0.99 - -0.50			
-0.49 - -0.25			
-0.24 - 0.25			
0.26 - 0.50			
0.51 - 1.00			
> 1.00			
Shoreline as defined by the NJDEP			
Simulation Grid Extent			

0 250 500 1,000 Feet

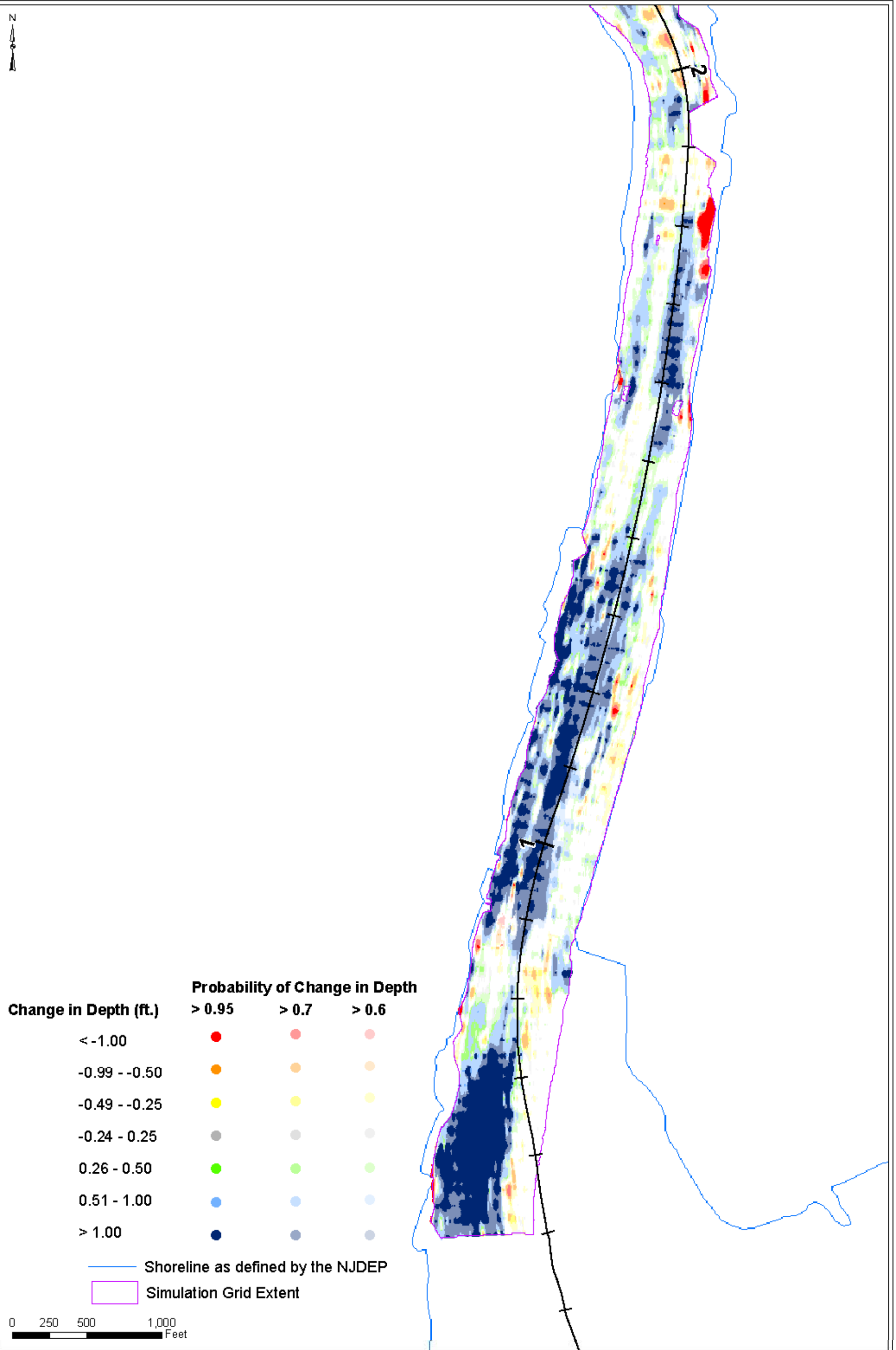


Conditional Simulation Results - RM 0.5 to 2  
1989 - 1995

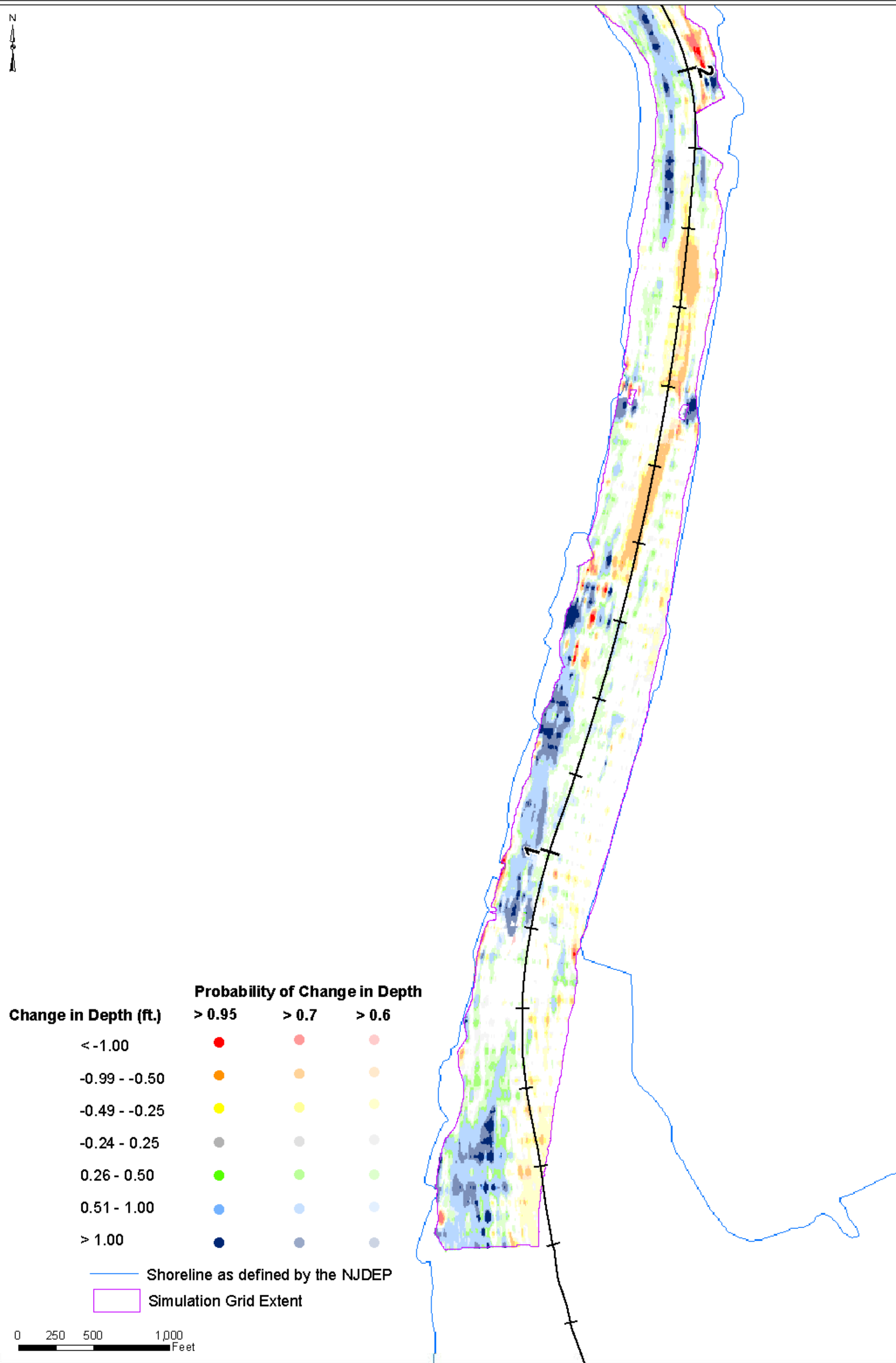
Lower Passaic River Restoration

Figure 11-21 c

June 2009

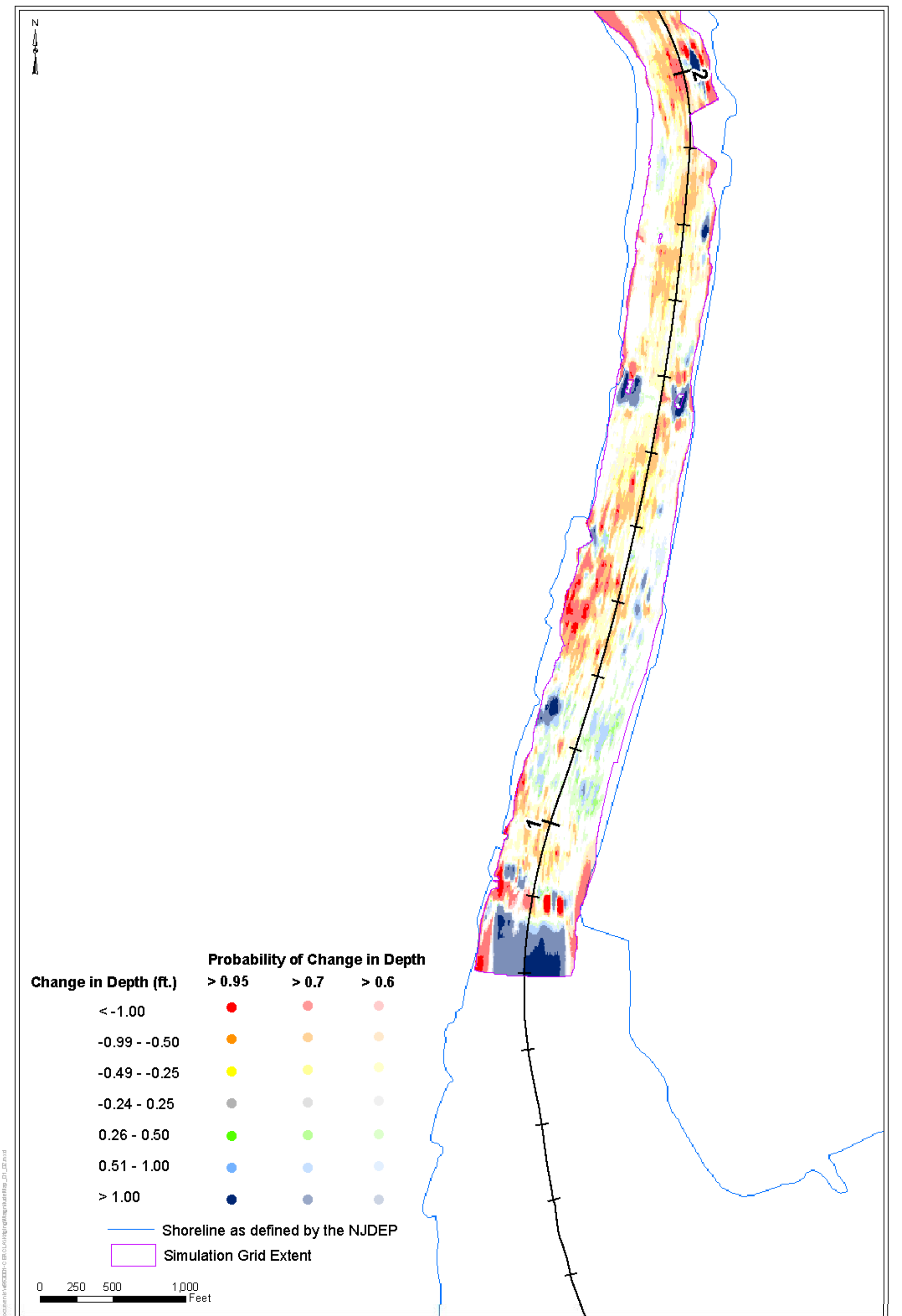












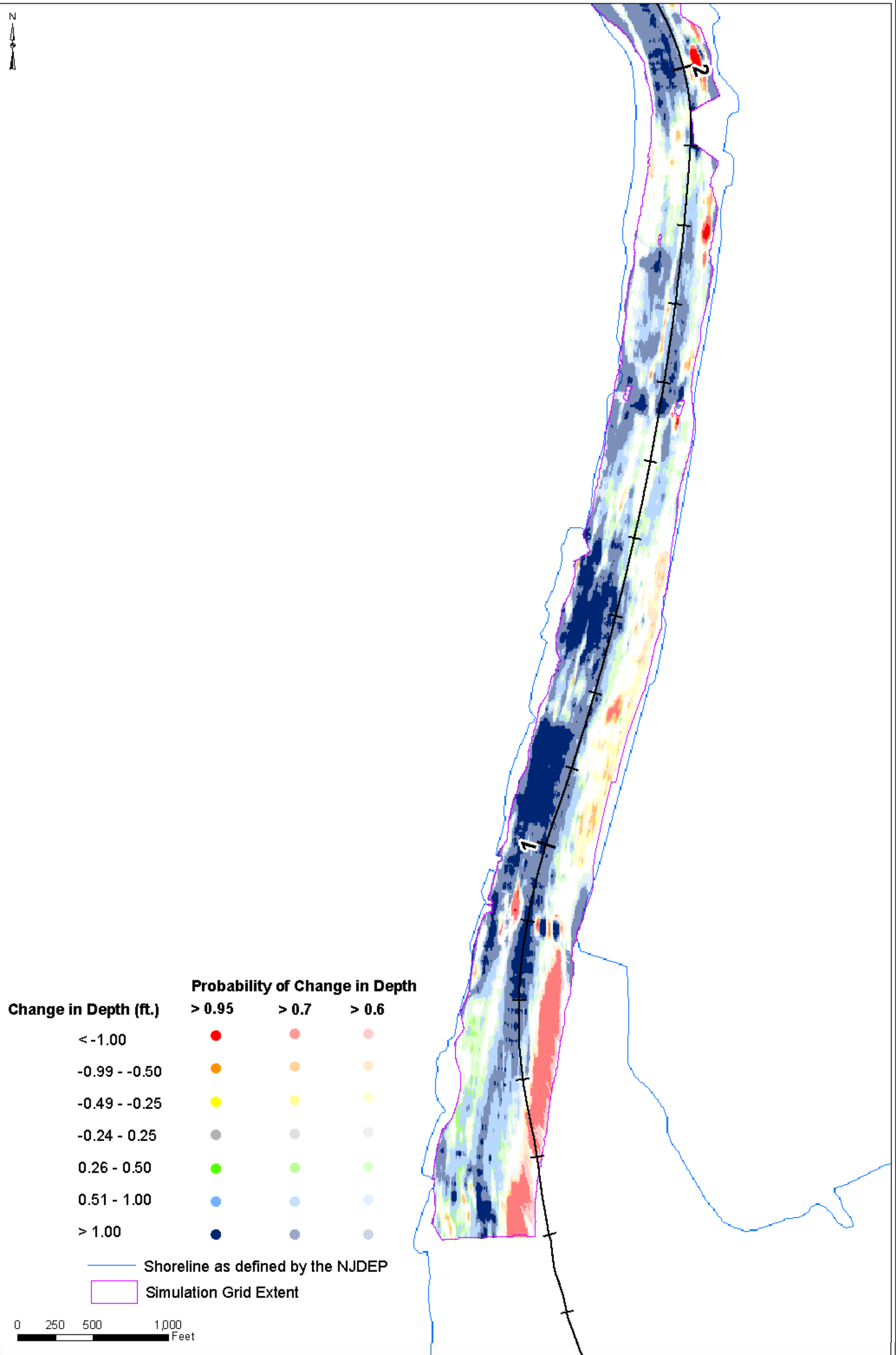
**Conditional Simulation Results - RM 0.5 to 2**  
**2001 - 2002**

*Lower Passaic River Restoration*

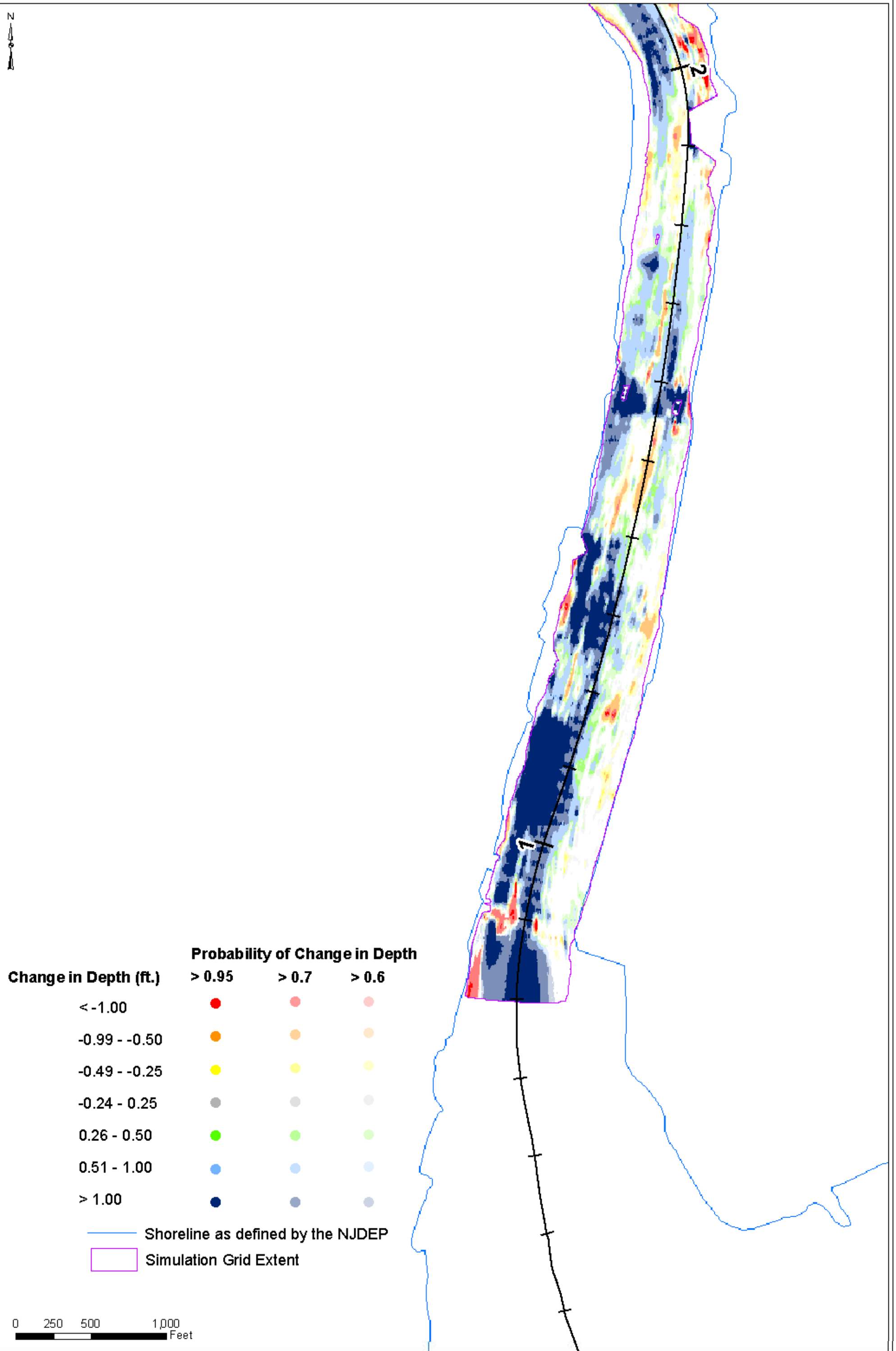
Figure 11-21h

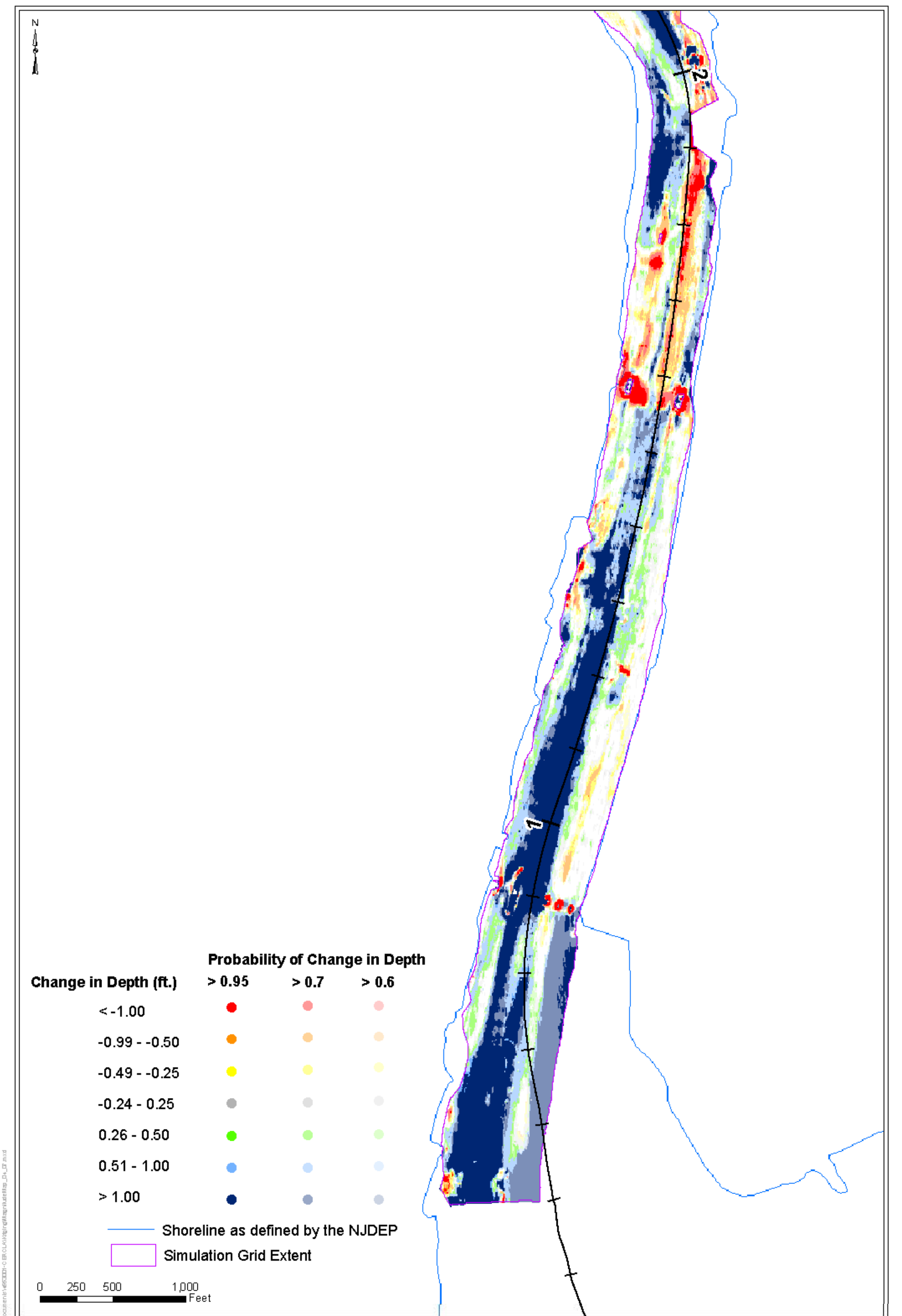
June 2009











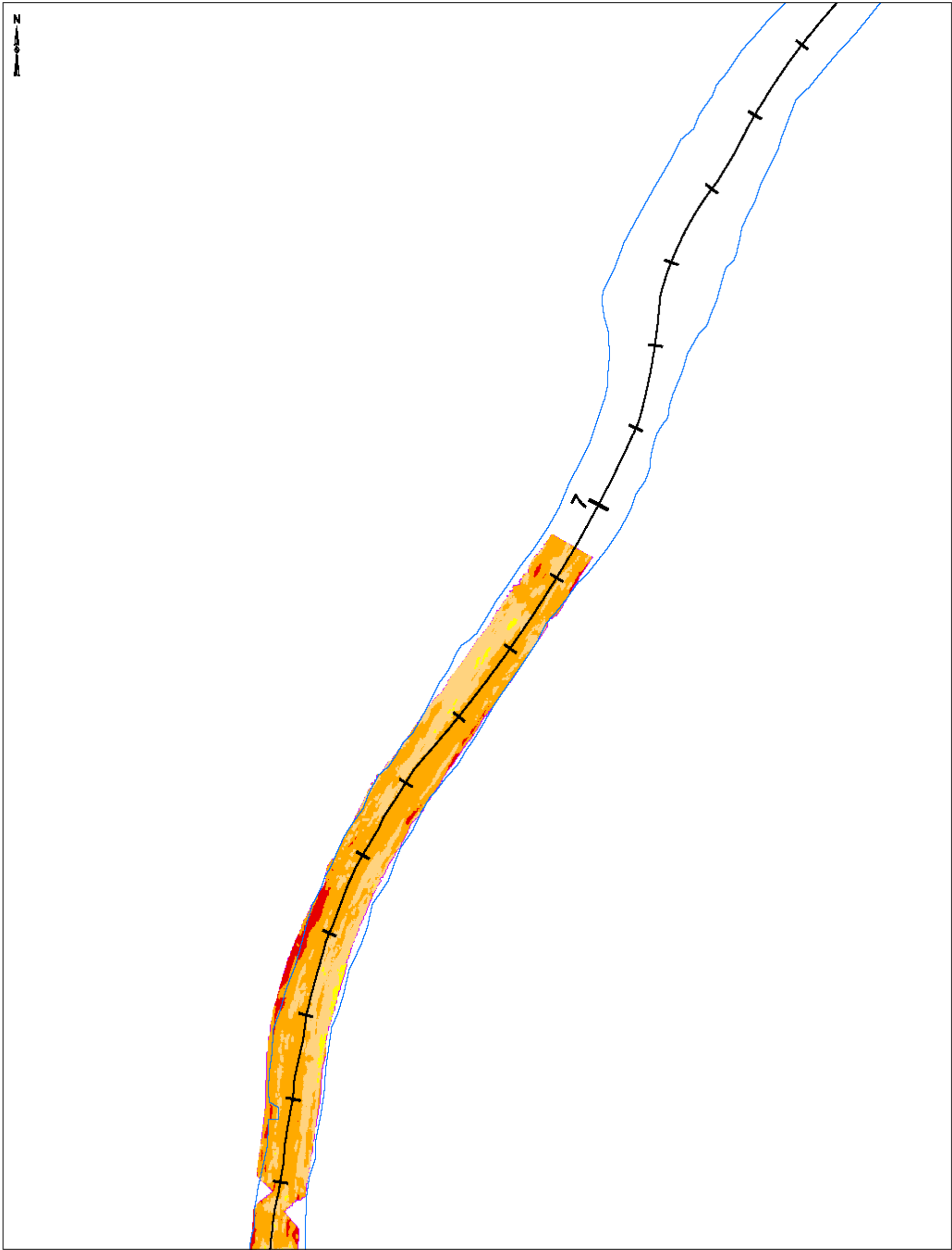
Conditional Simulation Results - RM 0.5 to 2  
2004 - 2007

Figure 11-21k

June 2009

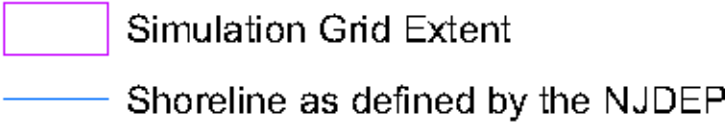
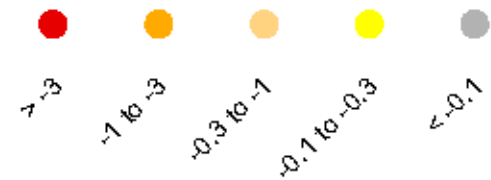
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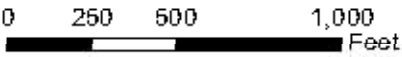


**Legend**

**Maximum Erosion Depth (feet)**



Note: The maximum erosion depth is defined as the maximum decrease in elevation observed between any two survey pairs, regardless of the length of time between surveys. Thus both adjacent survey pairs (e.g., 1995 and 1996) as well as non-adjacent survey pairs (e.g., 1997 and 2004) were considered in identifying these differences.

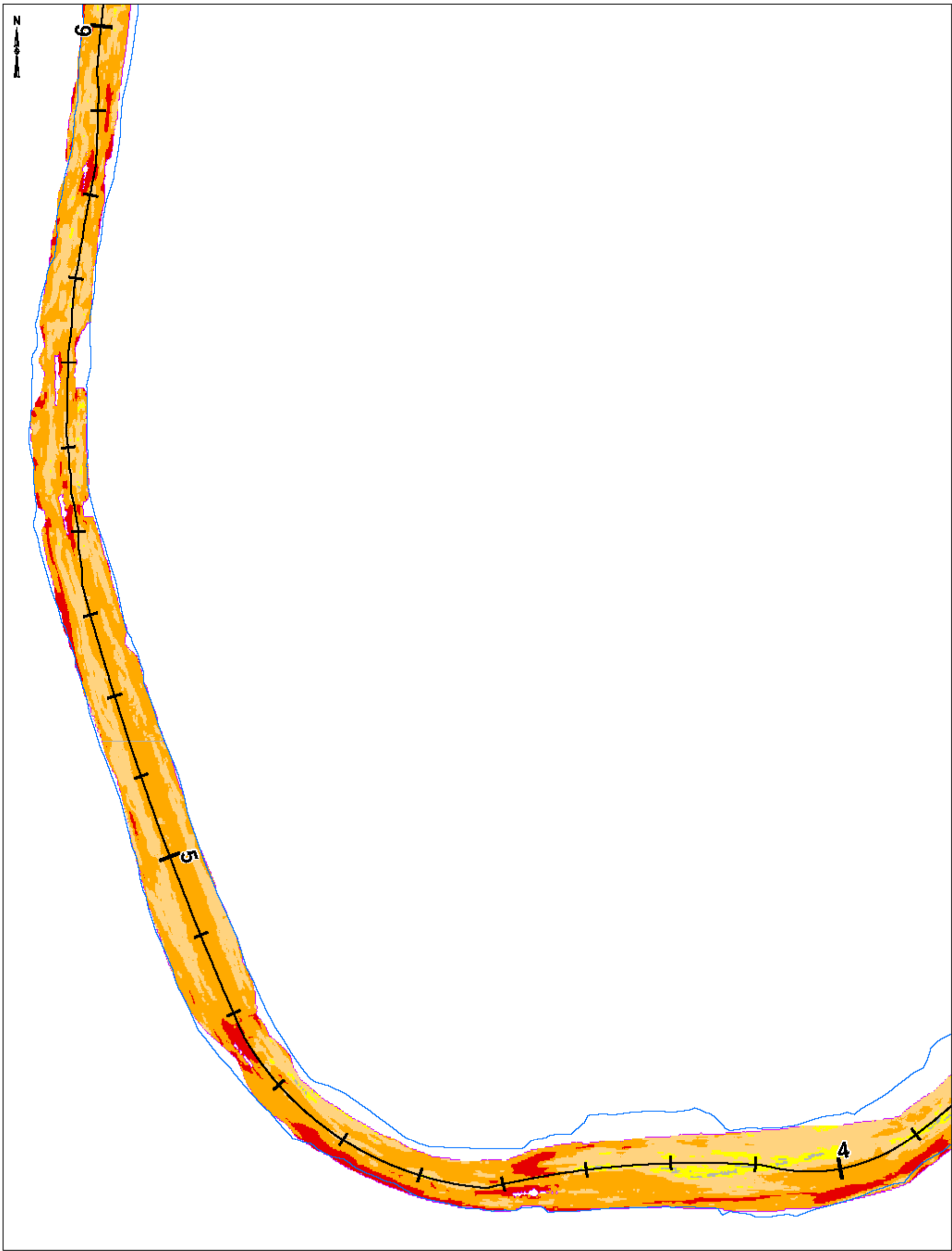


Maximum Observed Erosion Depth  
1989 through 2007  
*Lower Passaic River Restoration*

Figure 11-22a

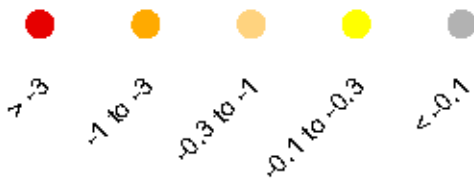
2009





Legend

Maximum Erosion Depth (feet)



- Simulation Grid Extent
- Shoreline as defined by the NJDEP

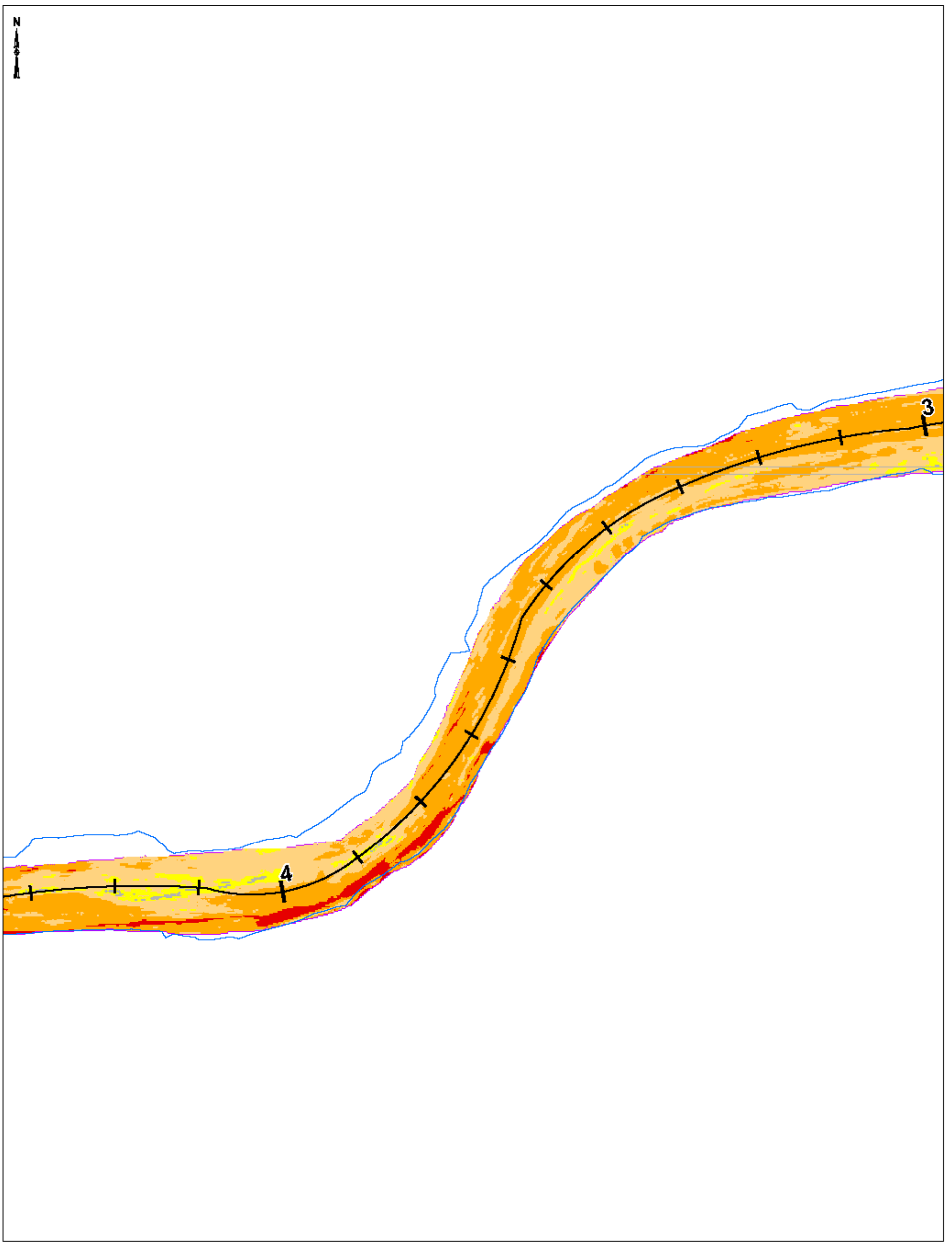
Note: The maximum erosion depth is defined as the maximum decrease in elevation observed between any two survey pairs, regardless of the length of time between surveys. Thus both adjacent survey pairs (e.g., 1995 and 1996) as well as non-adjacent survey pairs (e.g., 1997 and 2004) were considered in identifying these differences.



Maximum Observed Erosion Depth  
1989 through 2007  
*Lower Passaic River Restoration*

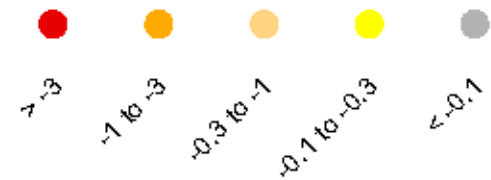
Figure 11-22b

2009



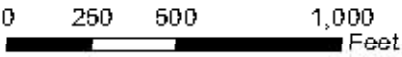
Legend

Maximum Erosion Depth (feet)



- Simulation Grid Extent
- Shoreline as defined by the NJDEP

Note: The maximum erosion depth is defined as the maximum decrease in elevation observed between any two survey pairs, regardless of the length of time between surveys. Thus both adjacent survey pairs (e.g., 1995 and 1996) as well as non-adjacent survey pairs (e.g., 1997 and 2004) were considered in identifying these differences.

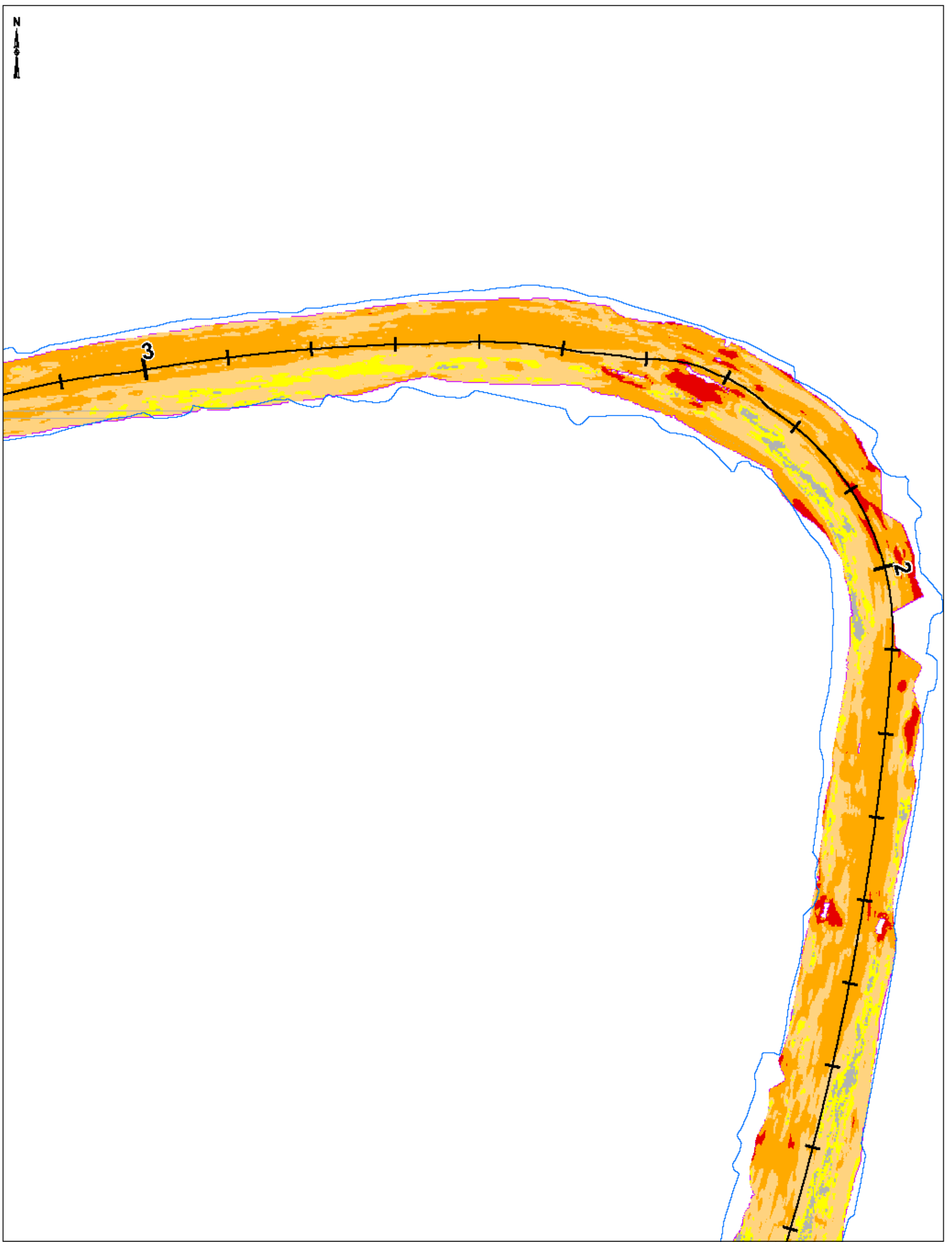


Maximum Observed Erosion Depth  
1989 through 2007  
*Lower Passaic River Restoration*

Figure 11-22c

2009





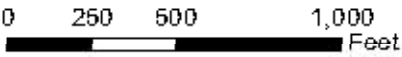
**Legend**

**Maximum Erosion Depth (feet)**



- Simulation Grid Extent
- Shoreline as defined by the NJDEP

Note: The maximum erosion depth is defined as the maximum decrease in elevation observed between any two survey pairs, regardless of the length of time between surveys. Thus both adjacent survey pairs (e.g., 1995 and 1996) as well as non-adjacent survey pairs (e.g., 1997 and 2004) were considered in identifying these differences.

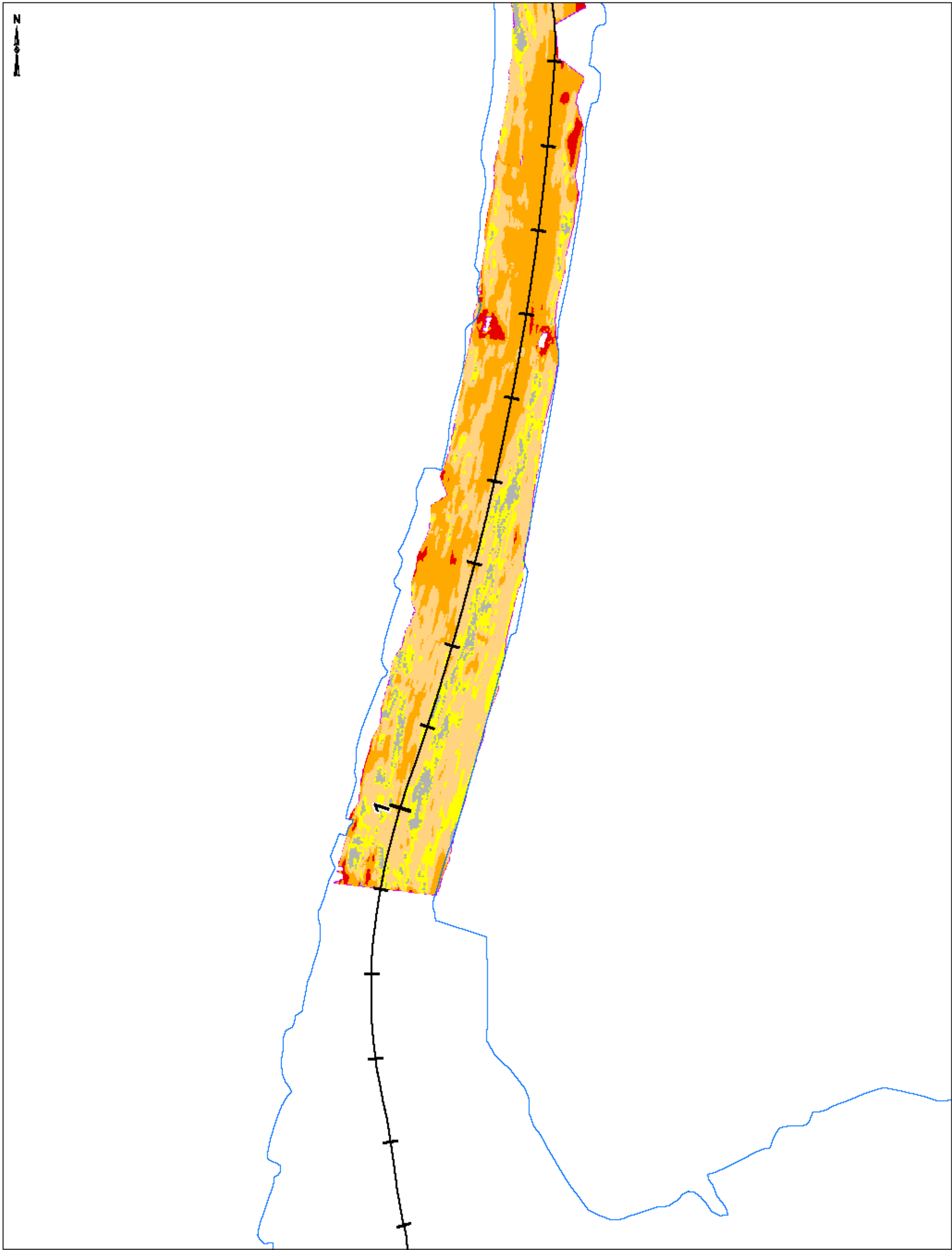


Maximum Observed Erosion Depth  
1989 through 2007  
*Lower Passaic River Restoration*

Figure 11-22d

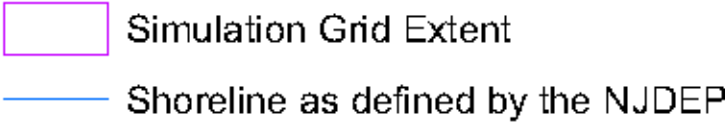
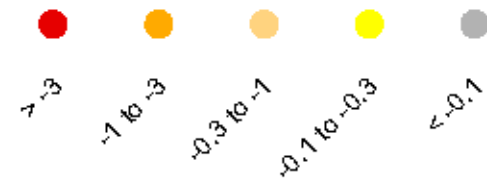
2009



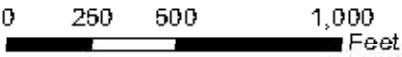


**Legend**

**Maximum Erosion Depth (feet)**



Note: The maximum erosion depth is defined as the maximum decrease in elevation observed between any two survey pairs, regardless of the length of time between surveys. Thus both adjacent survey pairs (e.g., 1995 and 1996) as well as non-adjacent survey pairs (e.g., 1997 and 2004) were considered in identifying these differences.

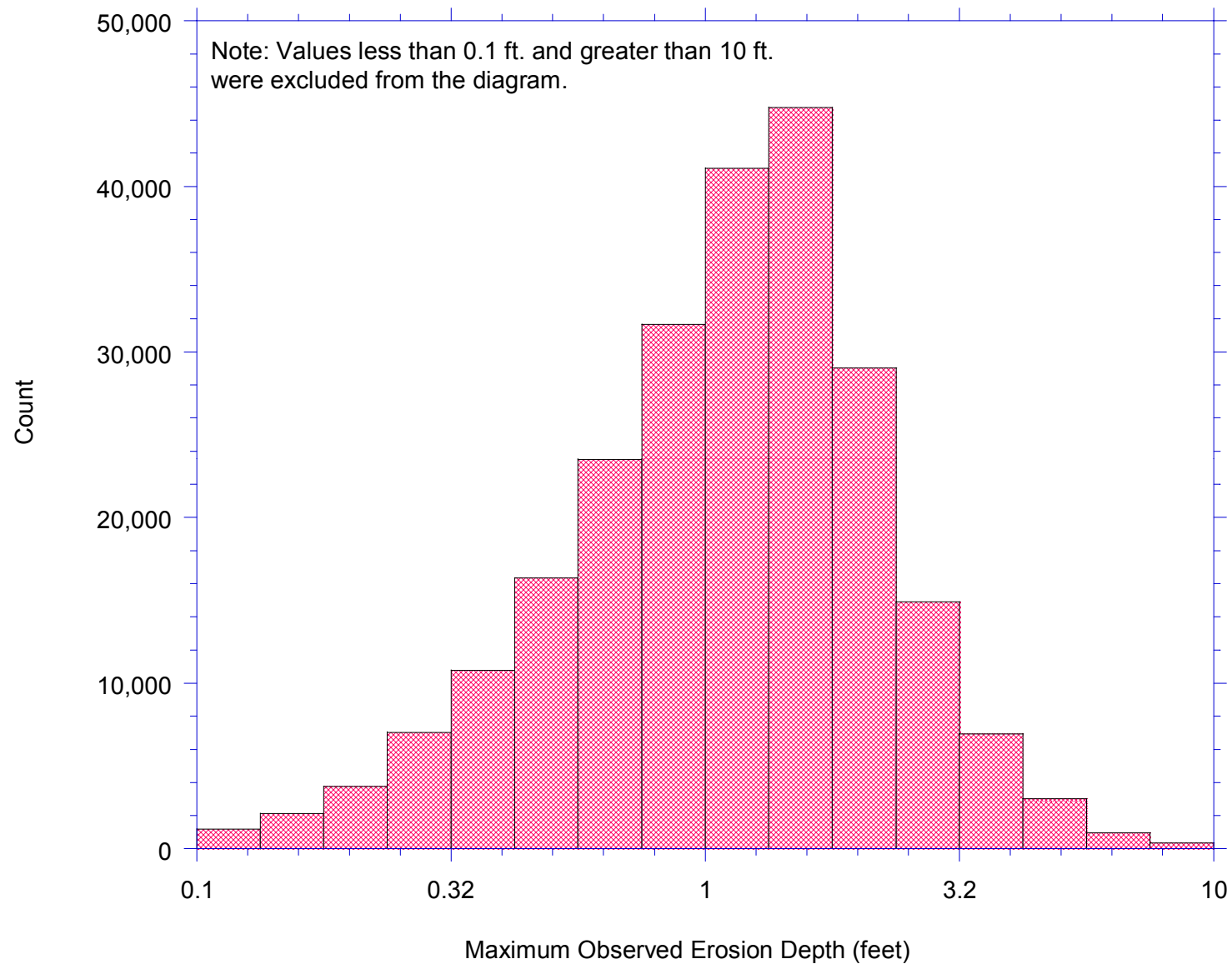


Maximum Observed Erosion Depth  
1989 through 2007  
*Lower Passaic River Restoration*

Figure 11-22e

2009





Histogram of Maximum Observed Erosion Depth

*Lower Passaic River Restoration Project*

Figure 11-23

2009



0 250 500 1,000 Feet

**Legend**

**Year 2 of the Survey Pair**

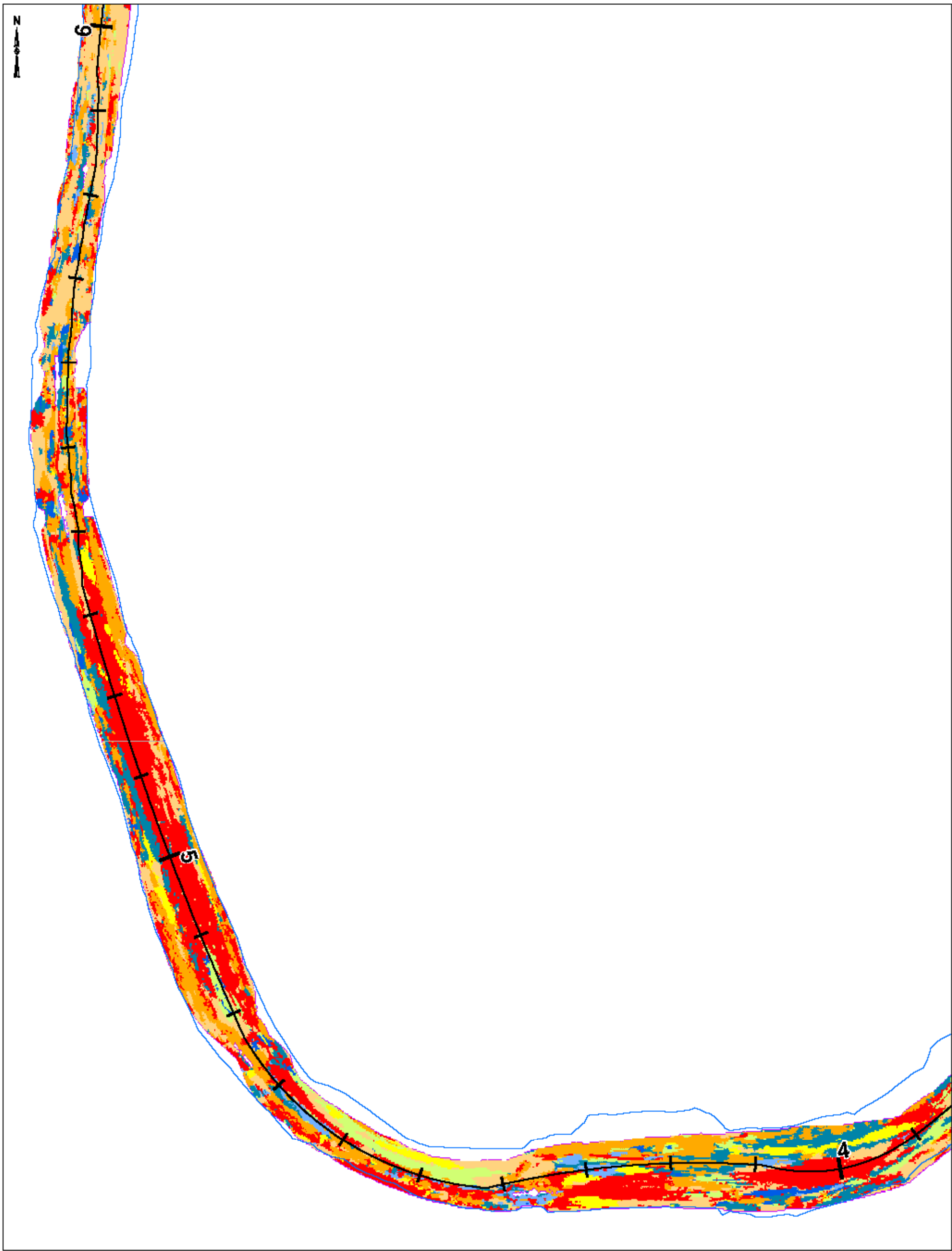
- 1995
- 1996
- 1997
- 1999
- 2001
- 2002
- 2004
- 2007

- Simulation Grid Extent
- Shoreline as defined by the NJDEP

Maximum Erosional Event by Year of Observation  
(Year 2 of Survey Pair)  
*Lower Passaic River Restoration*

Figure 11-24a

2009



0 250 500 1,000 Feet

Legend

Year 2 of the Survey Pair

- 1995
- 1996
- 1997
- 1999
- 2001
- 2002
- 2004
- 2007

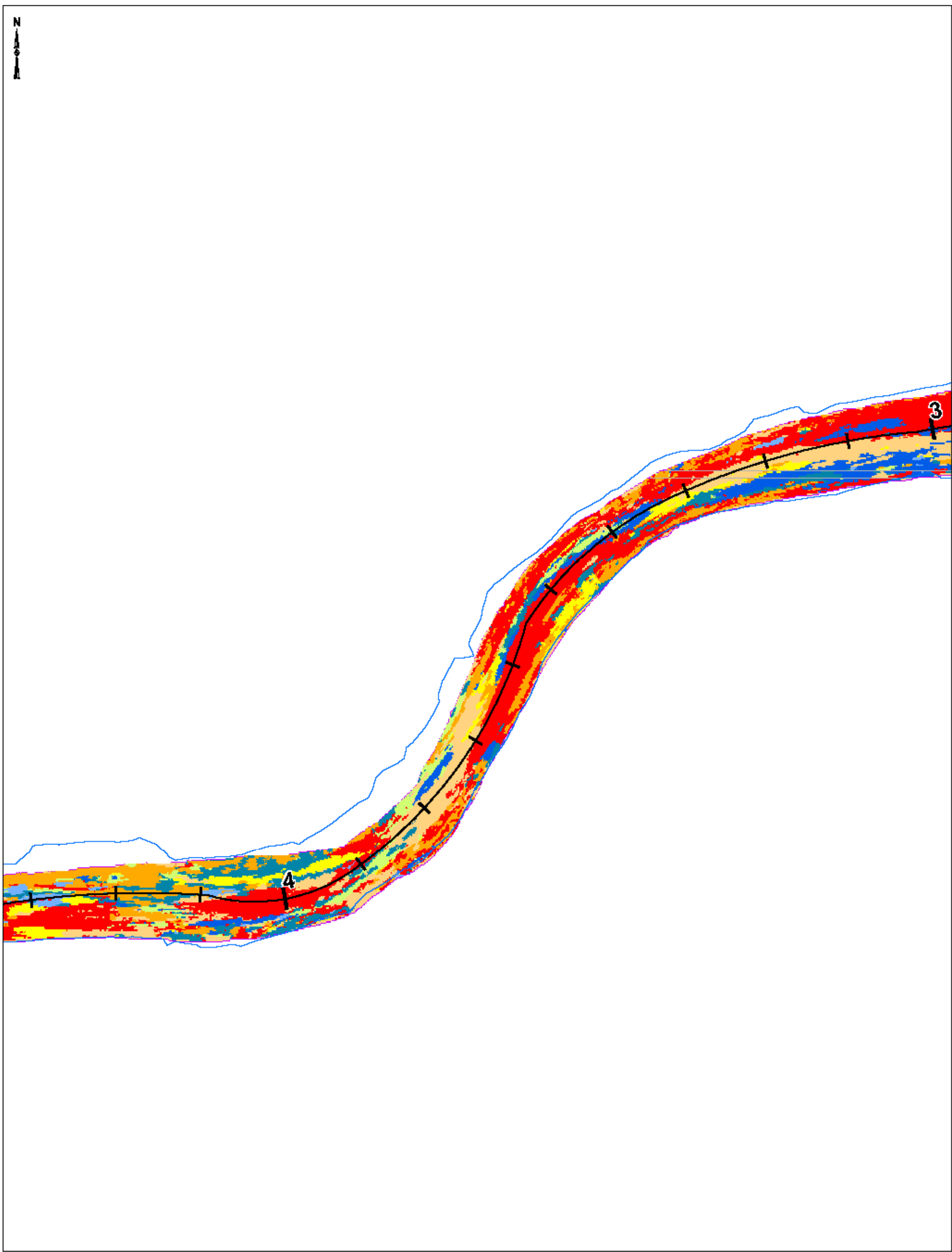
- Simulation Grid Extent
- Shoreline as defined by the NJDEP

Maximum Erosional Event by Year of Observation  
(Year 2 of Survey Pair)  
*Lower Passaic River Restoration*

Figure 11-24b

2009





0 250 500 1,000 Feet

Legend

Year 2 of the Survey Pair

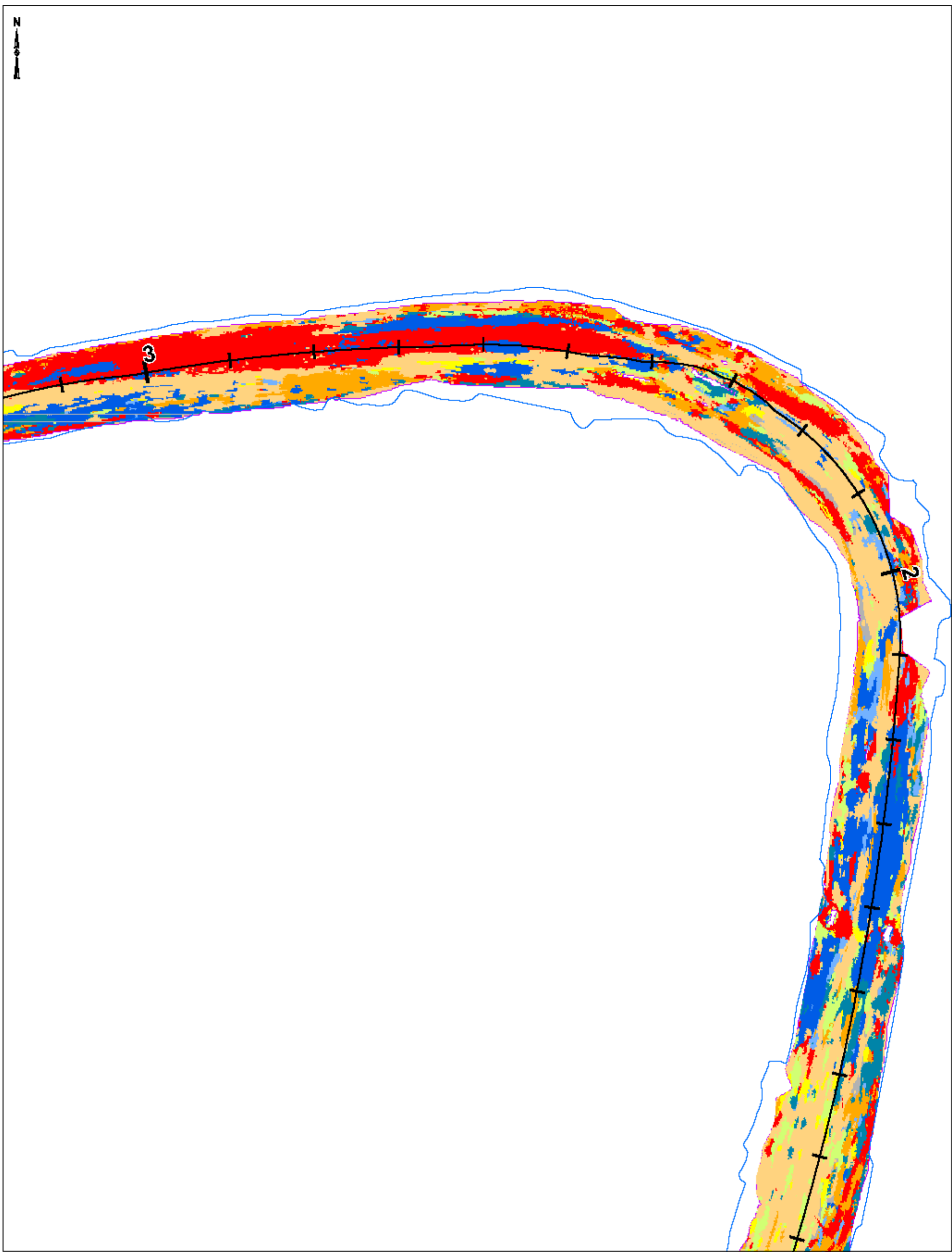
- 1995
- 1996
- 1997
- 1999
- 2001
- 2002
- 2004
- 2007

- Simulation Grid Extent
- Shoreline as defined by the NJDEP

Maximum Erosional Event by Year of Observation  
(Year 2 of Survey Pair)  
*Lower Passaic River Restoration*

Figure 11-24c

2009



0 250 500 1,000 Feet

**Legend**

**Year 2 of the Survey Pair**

- 1995
- 1996
- 1997
- 1999
- 2001
- 2002
- 2004
- 2007

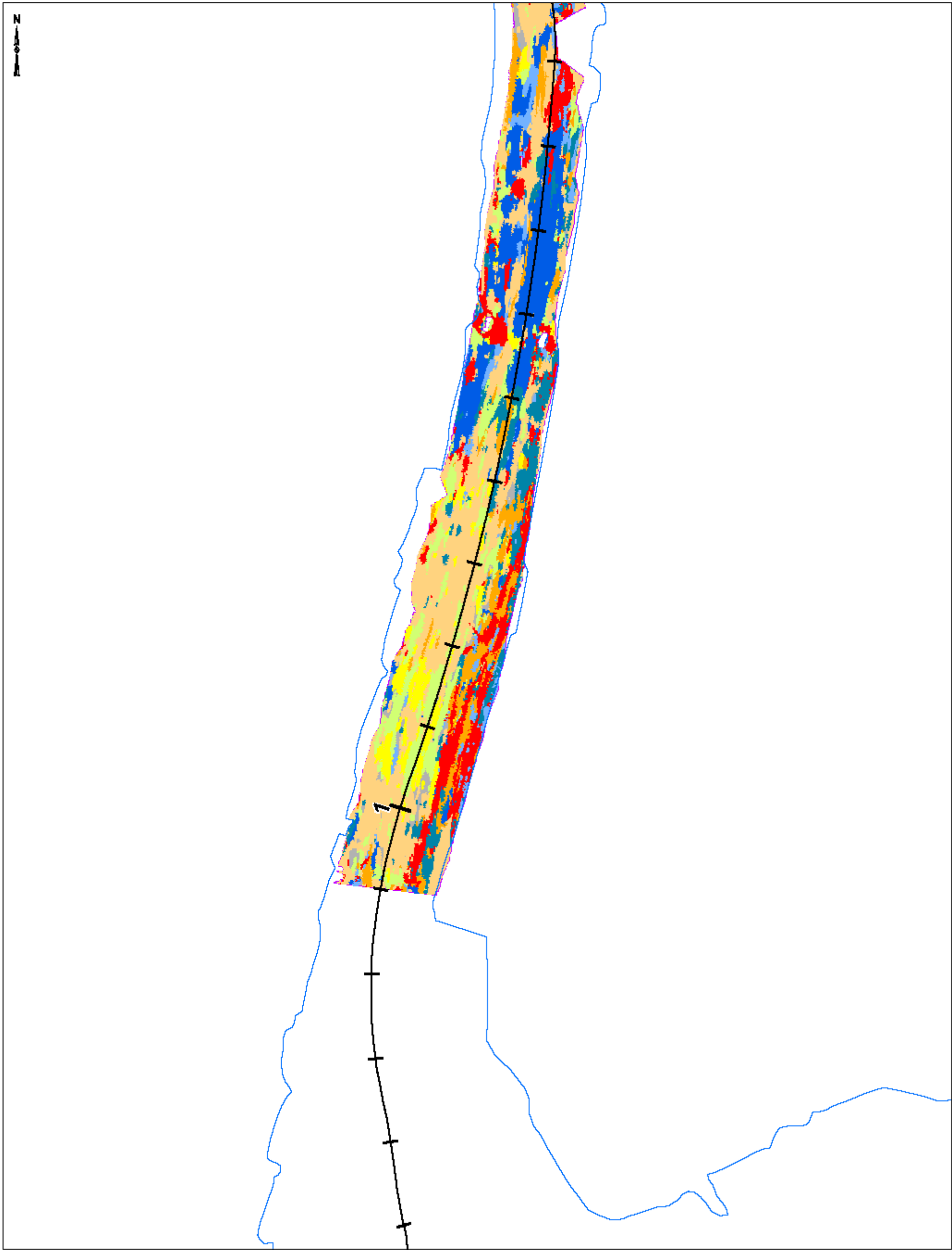
- Simulation Grid Extent
- Shoreline as defined by the NJDEP

Maximum Erosional Event by Year of Observation  
(Year 2 of Survey Pair)  
*Lower Passaic River Restoration*

Figure 11-24d

2009





0 250 500 1,000 Feet

**Legend**

**Year 2 of the Survey Pair**

- 1995
- 1996
- 1997
- 1999
- 2001
- 2002
- 2004
- 2007

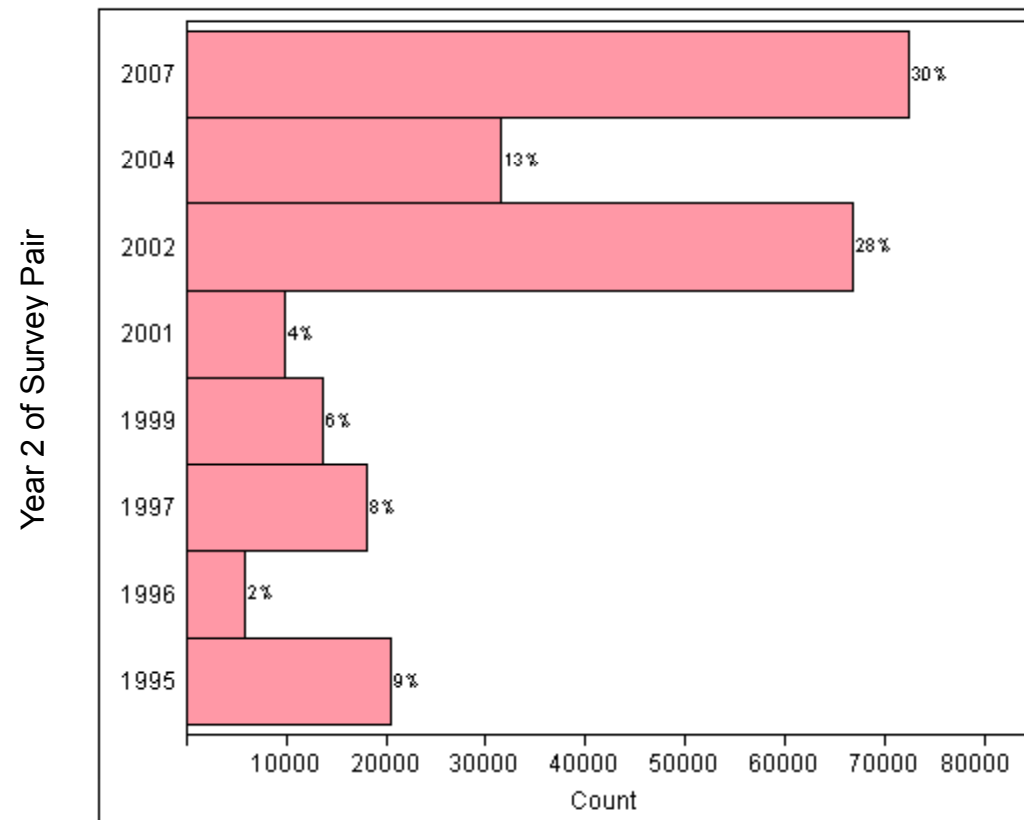
Simulation Grid Extent

Shoreline as defined by the NJDEP

Maximum Erosional Event by Year of Observation  
(Year 2 of Survey Pair)  
*Lower Passaic River Restoration*

Figure 11-24e

2009



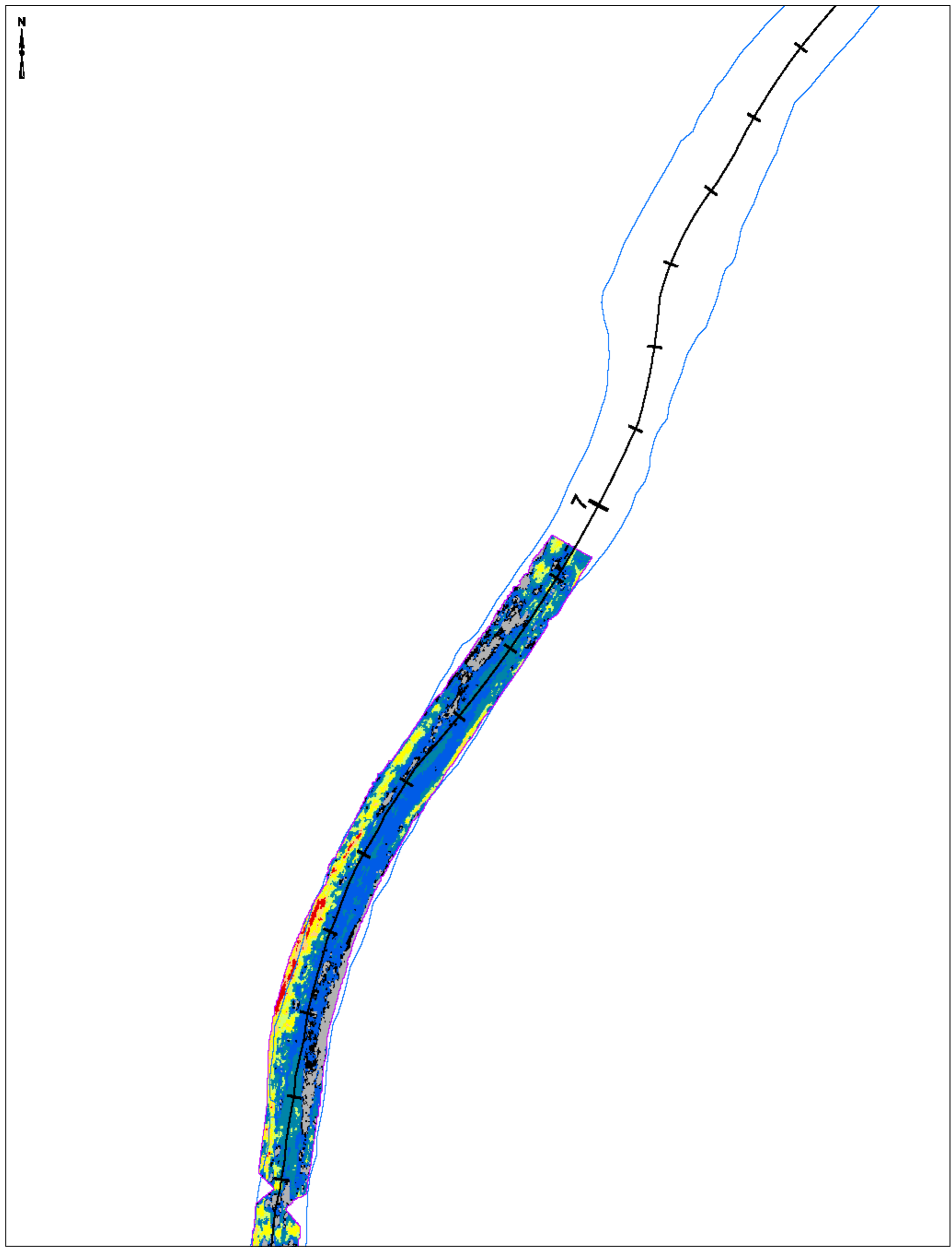
Histogram of Occurrence of Maximum Erosion Event  
by Year 2 of Survey Pair Comparison

*Lower Passaic River Restoration Project*

Figure 11-25

2009

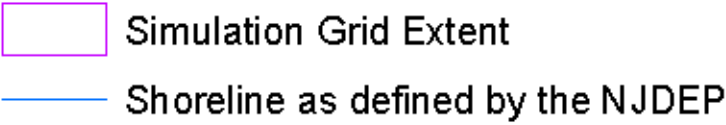
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0 250 500 1,000 Feet

Legend

Number of Erosional Observation with a 70% Level of Confidence

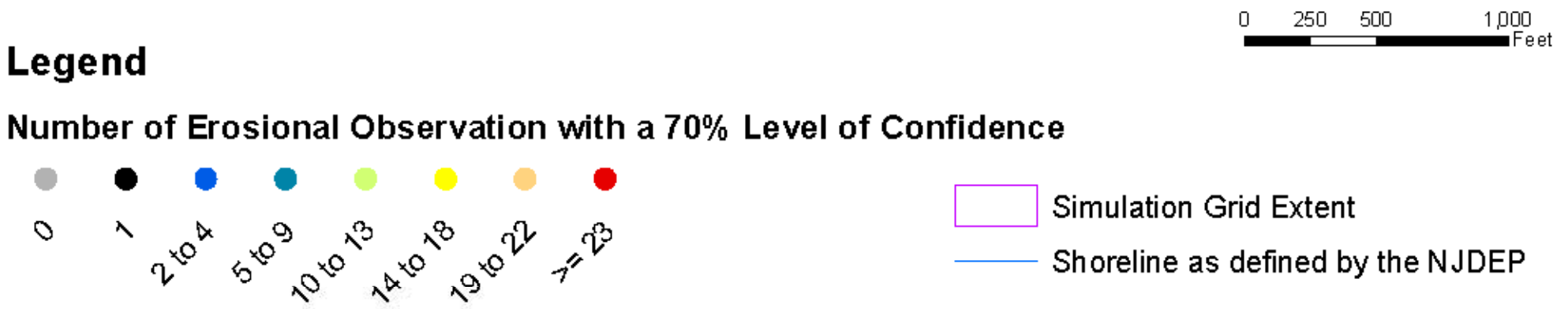
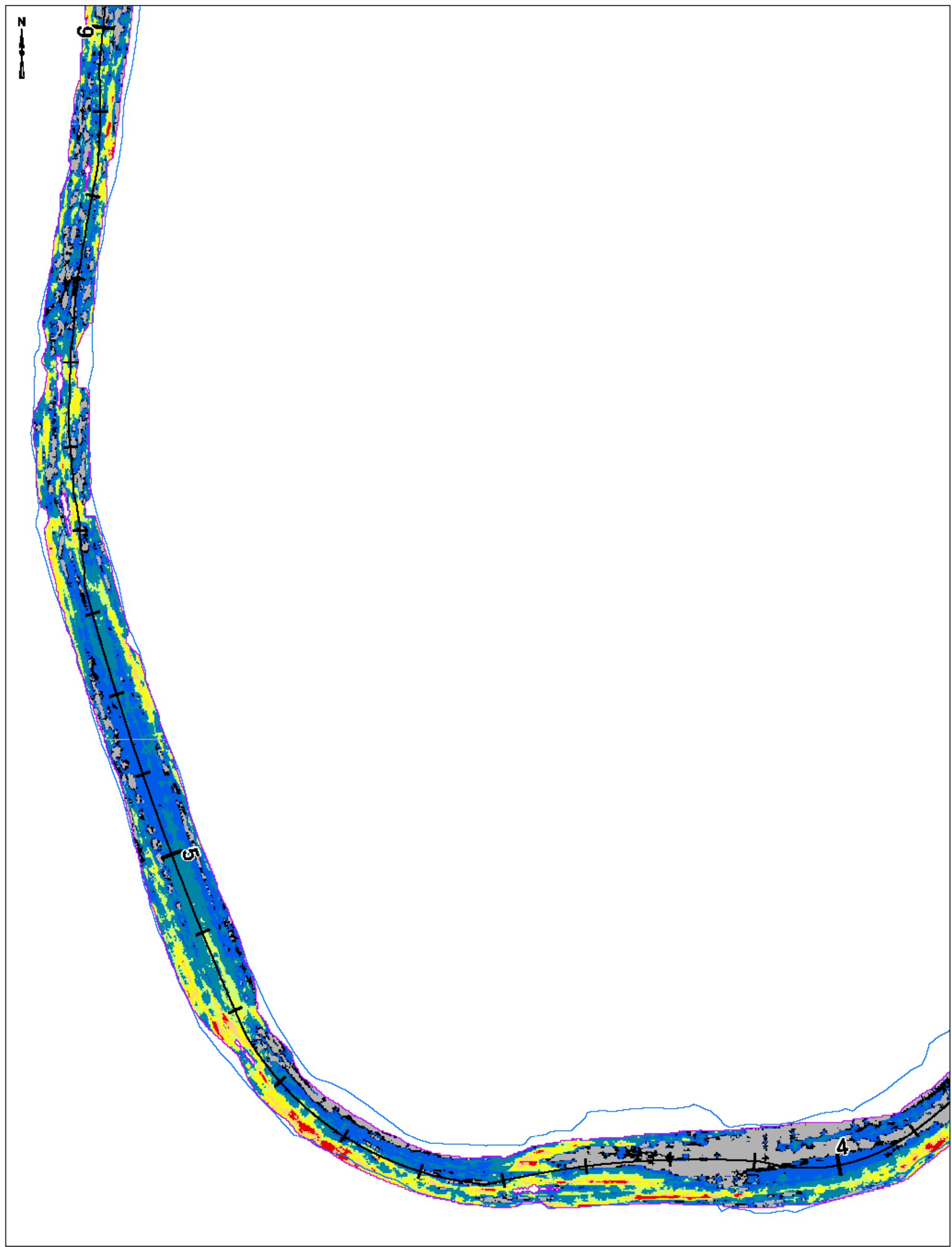


Conditional Simulation Results  
Count of Survey Pairs Showing Erosion with 70% Level of Confidence  
*Lower Passaic River Restoration*

Figure 11-26a  
2009



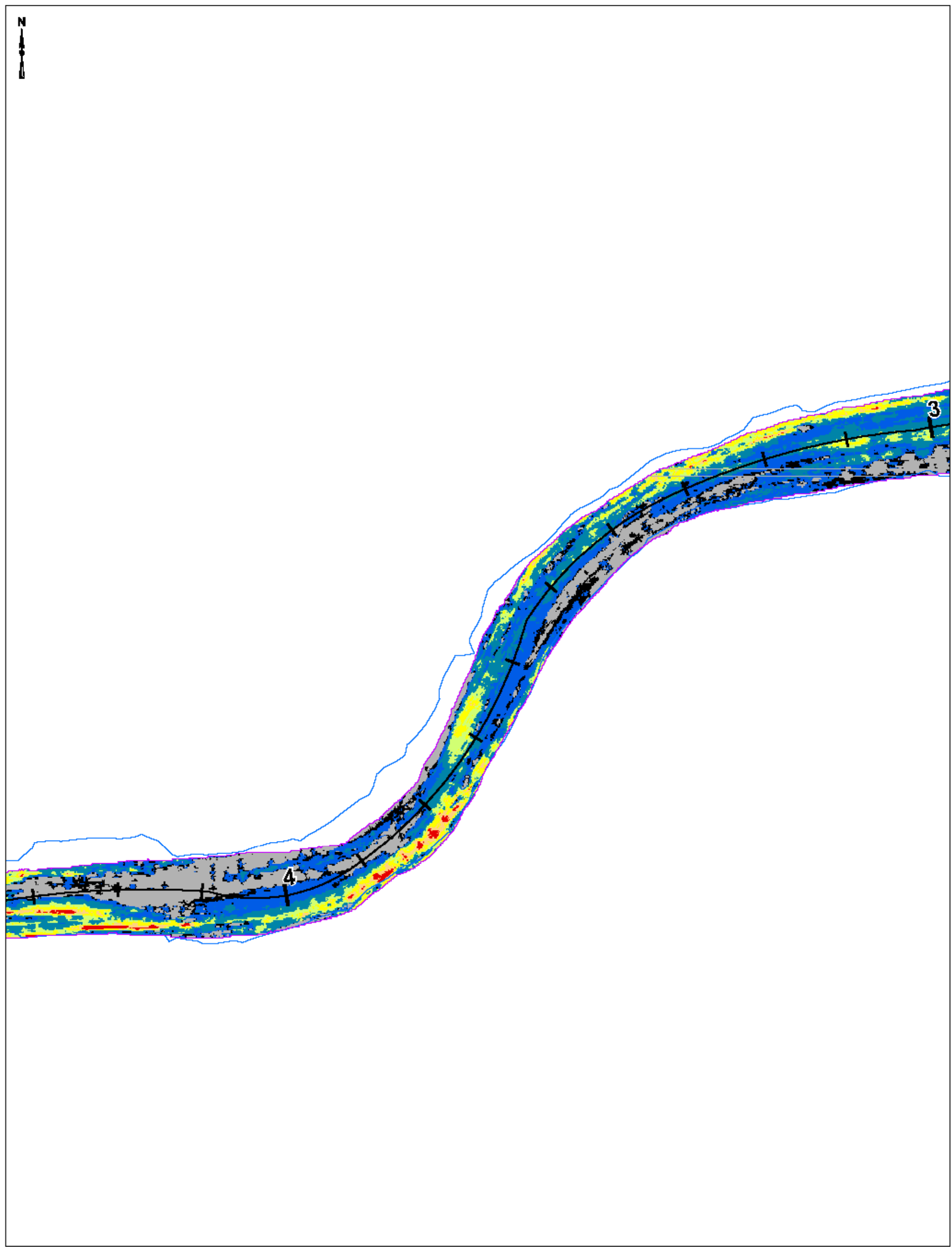
P:\10285924\Mapping\CSM\_MassBalance\bathymetry\_frequency\_depth\_map\_wbookmark\_v3.mxd



Conditional Simulation Results  
Count of Survey Pairs Showing Erosion with 70% Level of Confidence  
*Lower Passaic River Restoration*

Figure 11-26b  
2009

P:\10285924\Mapping\CSM\_MassBalance\bathymetry\_frequency\_depth\_map\_wbookmark\_v3.mxd



### Legend

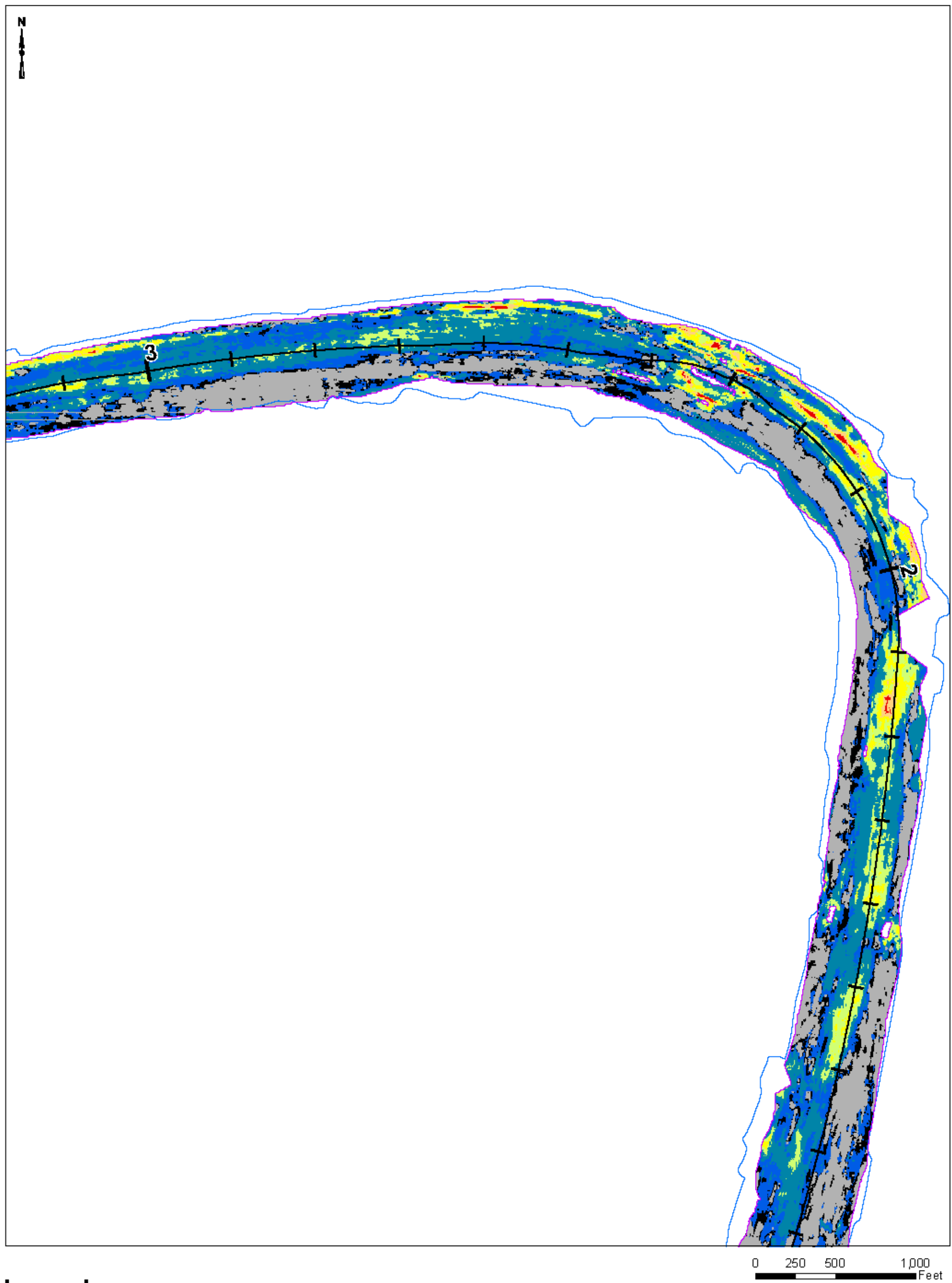
**Number of Erosional Observation with a 70% Level of Confidence**

0	1	2 to 4	5 to 9	10 to 13	14 to 18	19 to 22	>= 23
Grey	Black	Blue	Teal	Light Green	Yellow	Orange	Red

Simulation Grid Extent

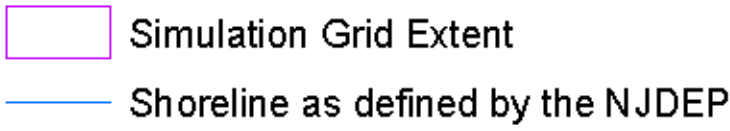
Shoreline as defined by the NJDEP

P:\10285924\Mapping\CSM\_MassBalance\bathymetry\_frequency\_depth\_map\_wbookmark\_v3.mxd



### Legend

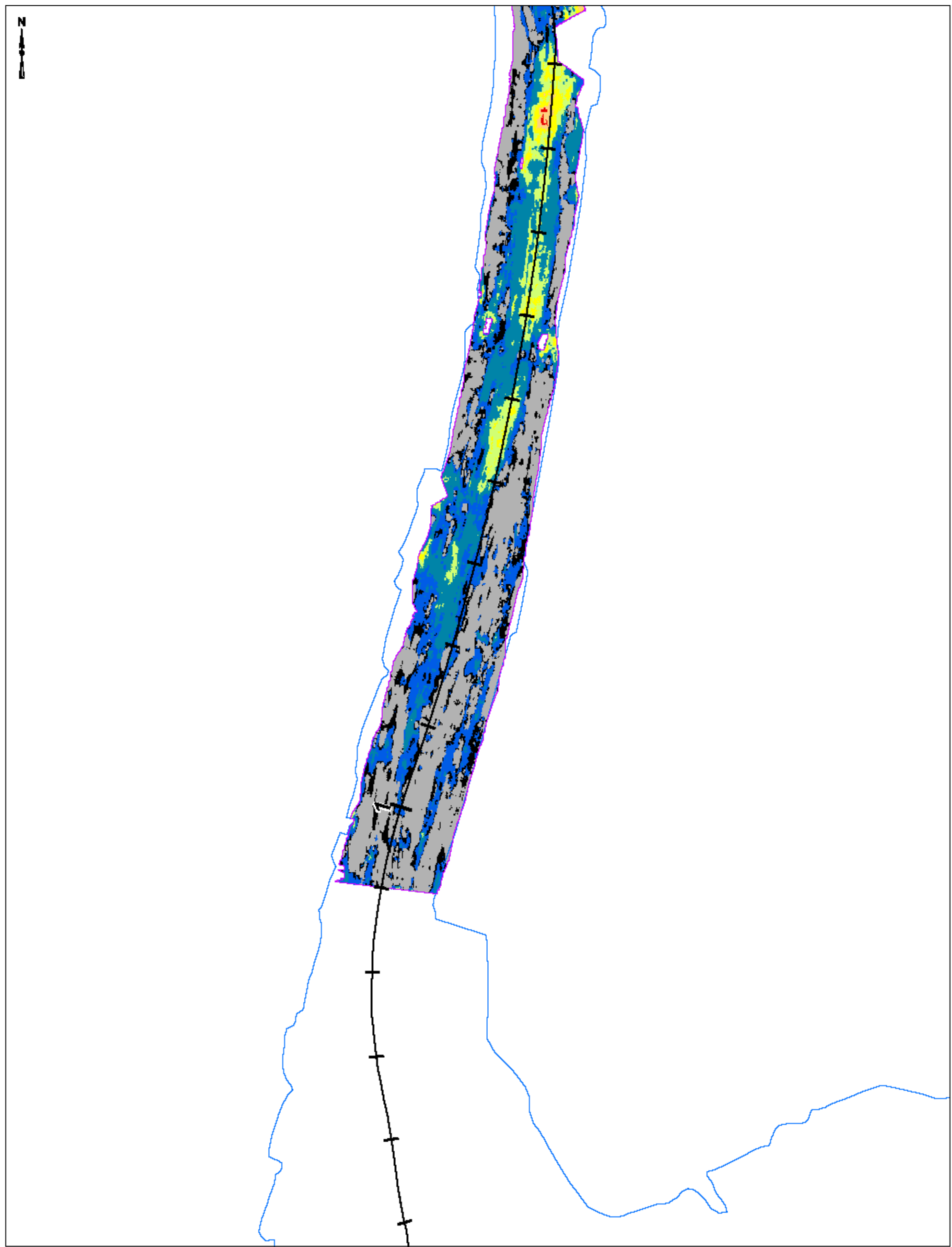
Number of Erosional Observation with a 70% Level of Confidence



Conditional Simulation Results  
Count of Survey Pairs Showing Erosion with 70% Level of Confidence  
*Lower Passaic River Restoration*

Figure 11-26d  
2009

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### Legend

**Number of Erosional Observation with a 70% Level of Confidence**

0	1	2 to 4	5 to 9	10 to 13	14 to 18	19 to 22	≥ 23
---	---	--------	--------	----------	----------	----------	------

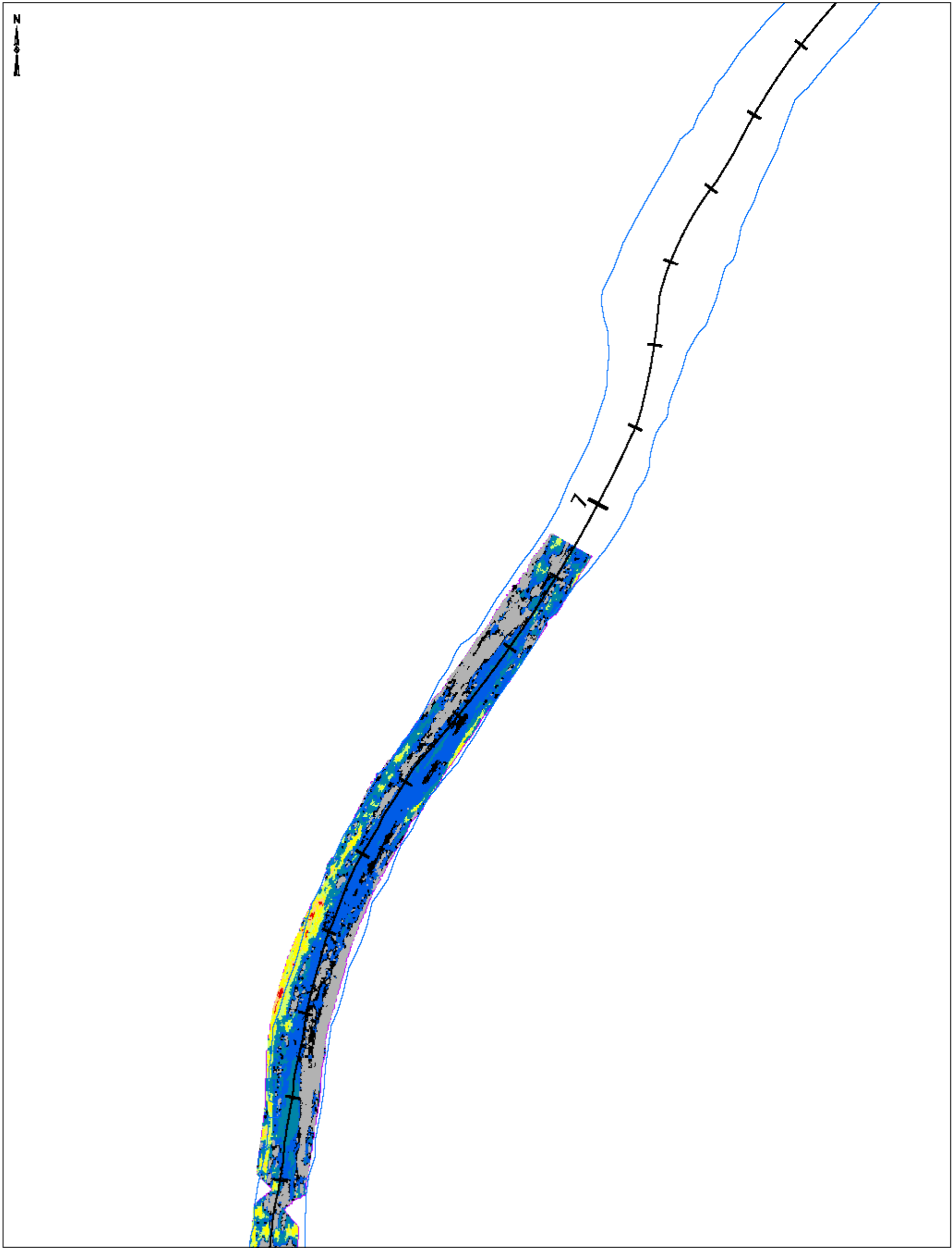
Simulation Grid Extent

Shoreline as defined by the NJDEP



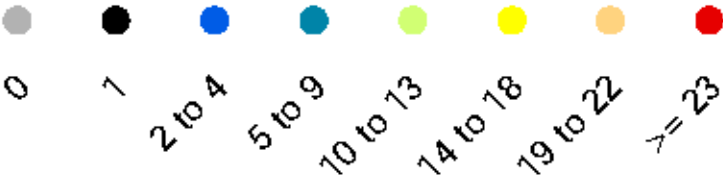
**Conditional Simulation Results**  
**Count of Survey Pairs Showing Erosion with 70% Level of Confidence**  
*Lower Passaic River Restoration*

**Figure 11-26e**  
**2009**

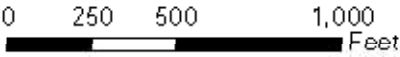


### Legend

Number of Occurrence (f3\_70)



- Simulation Grid Extent
- Shoreline as defined by the NJDEP

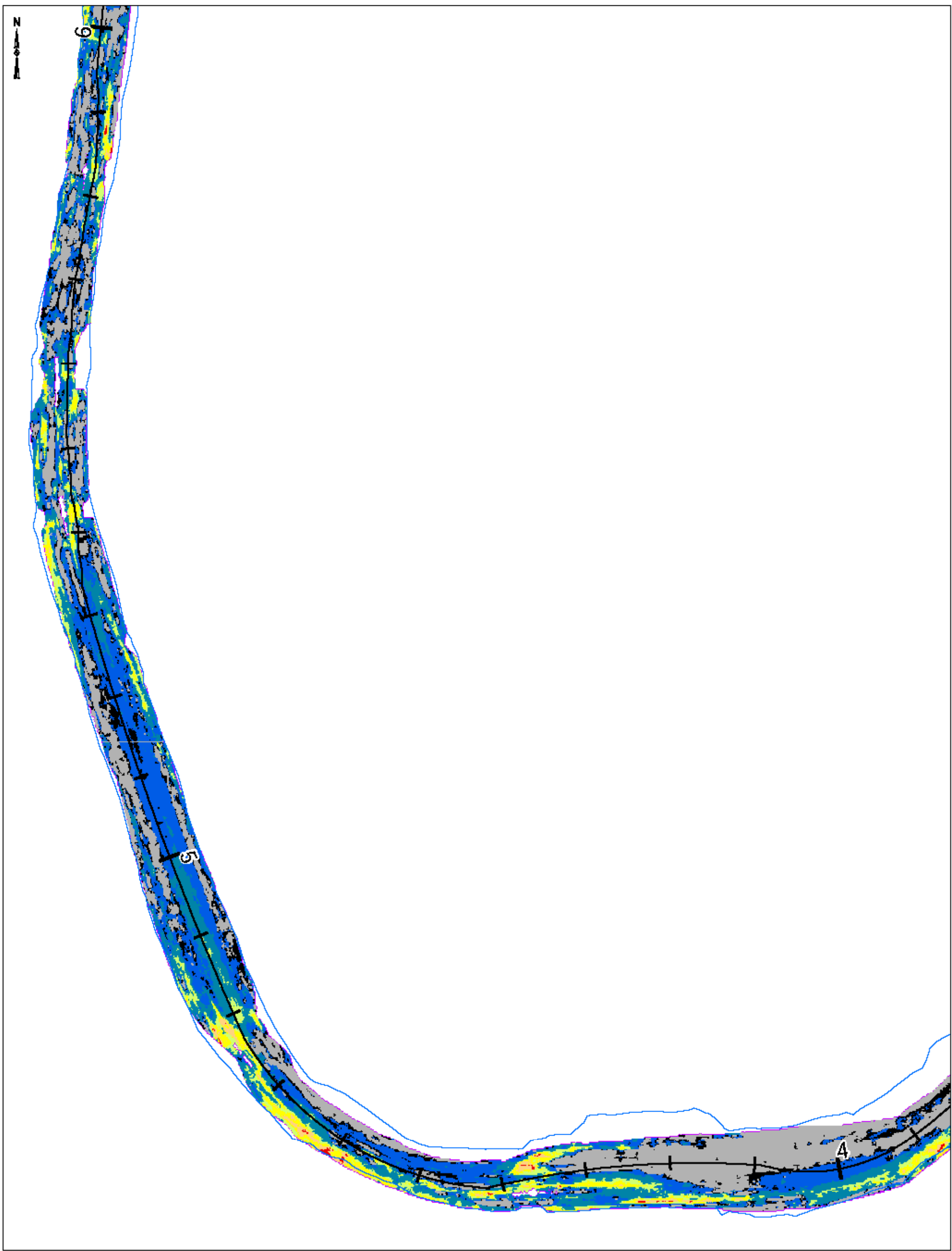


**Count of Survey Pairs Showing Erosion  
Conditional Simulation Results**

Figure 11-27a

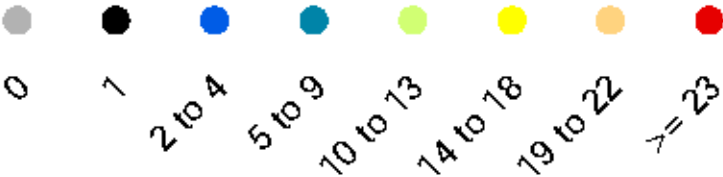
2009





# Legend

Number of Occurence (f3\_70)



- Simulation Grid Extent
- Shoreline as defined by the NJDEP

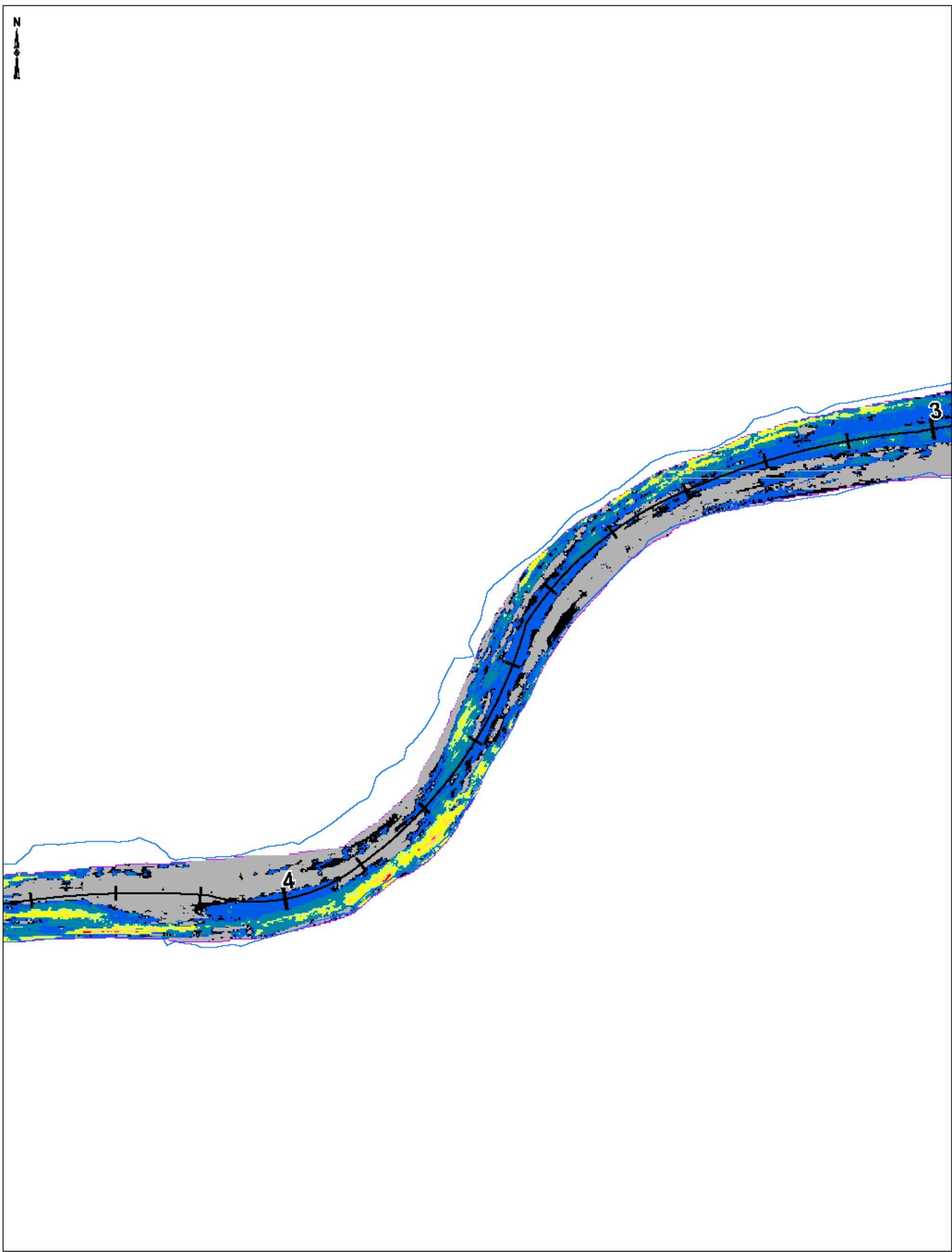
0 250 500 1,000 Feet

Count of Survey Pairs Showing Erosion  
Conditional Simulation Results

Figure 11-27b

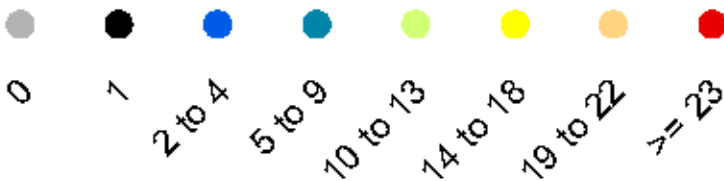
2009

Lower Passaic River Restoration



# Legend

Number of Occurence (f3\_70)



Simulation Grid Extent  
Shoreline as defined by the NJDEP

0 250 500 1,000 Feet

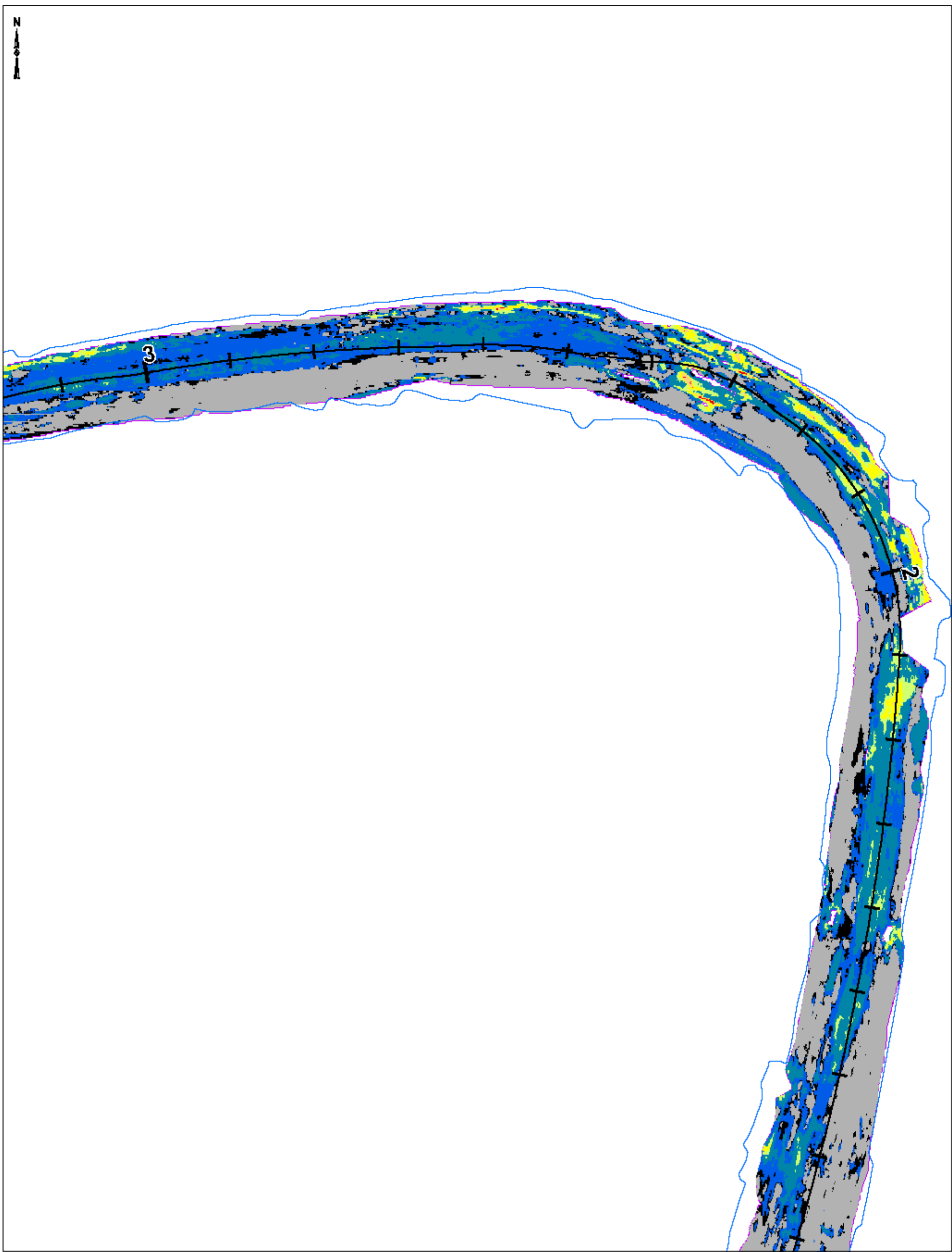


Count of Survey Pairs Showing Erosion  
Conditional Simulation Results

Lower Passaic River Restoration

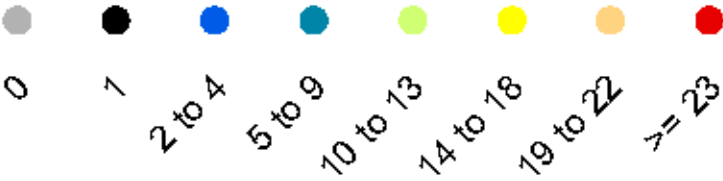
Figure 11-27c

2009



# Legend

Number of Occurence (f3\_70)



Simulation Grid Extent  
Shoreline as defined by the NJDEP

0 250 500 1,000  
Feet

Count of Survey Pairs Showing Erosion  
Conditional Simulation Results

Lower Passaic River Restoration

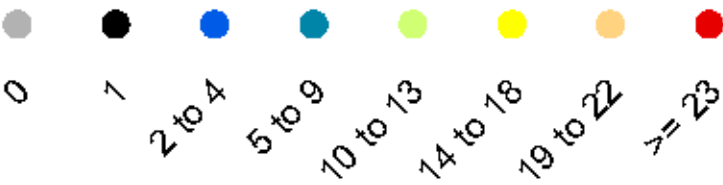
Figure 11-27 d

2009

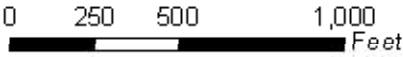


### Legend

Number of Occurrence (f3\_70)



Simulation Grid Extent  
Shoreline as defined by the NJDEP

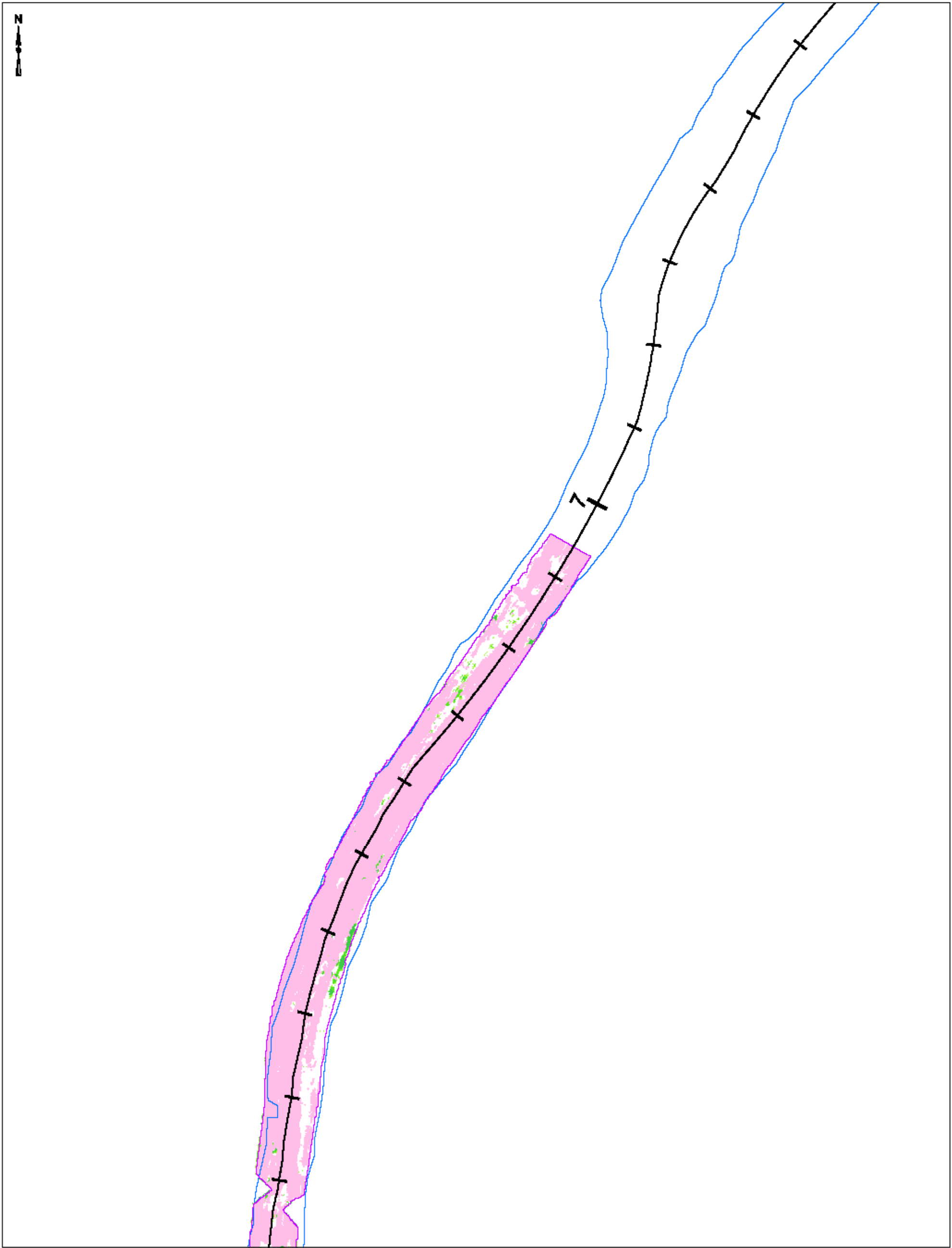


Count of Survey Pairs Showing Erosion  
Conditional Simulation Results

Lower Passaic River Restoration

Figure 11-27 e

2009



Legend

- Area Subject to Erosion (at least one 3 inch erosion event)
- Number of Depositional Observation with a 95% Level of Confidence
- 1
  - 2 to 4
  - 5 to 9
  - 10 to 13
  - 14 to 18
  - 19 to 22
  - >= 23

Note: The white areas within the simulation grid extent represents area where no erosional events were observed with a difference of 3 inches or more at a 70% level of confidence. These areas also had no observations of deposition with a 95% level of confidence.

- Simulation Grid Extent
- Shoreline as defined by the NJDEP

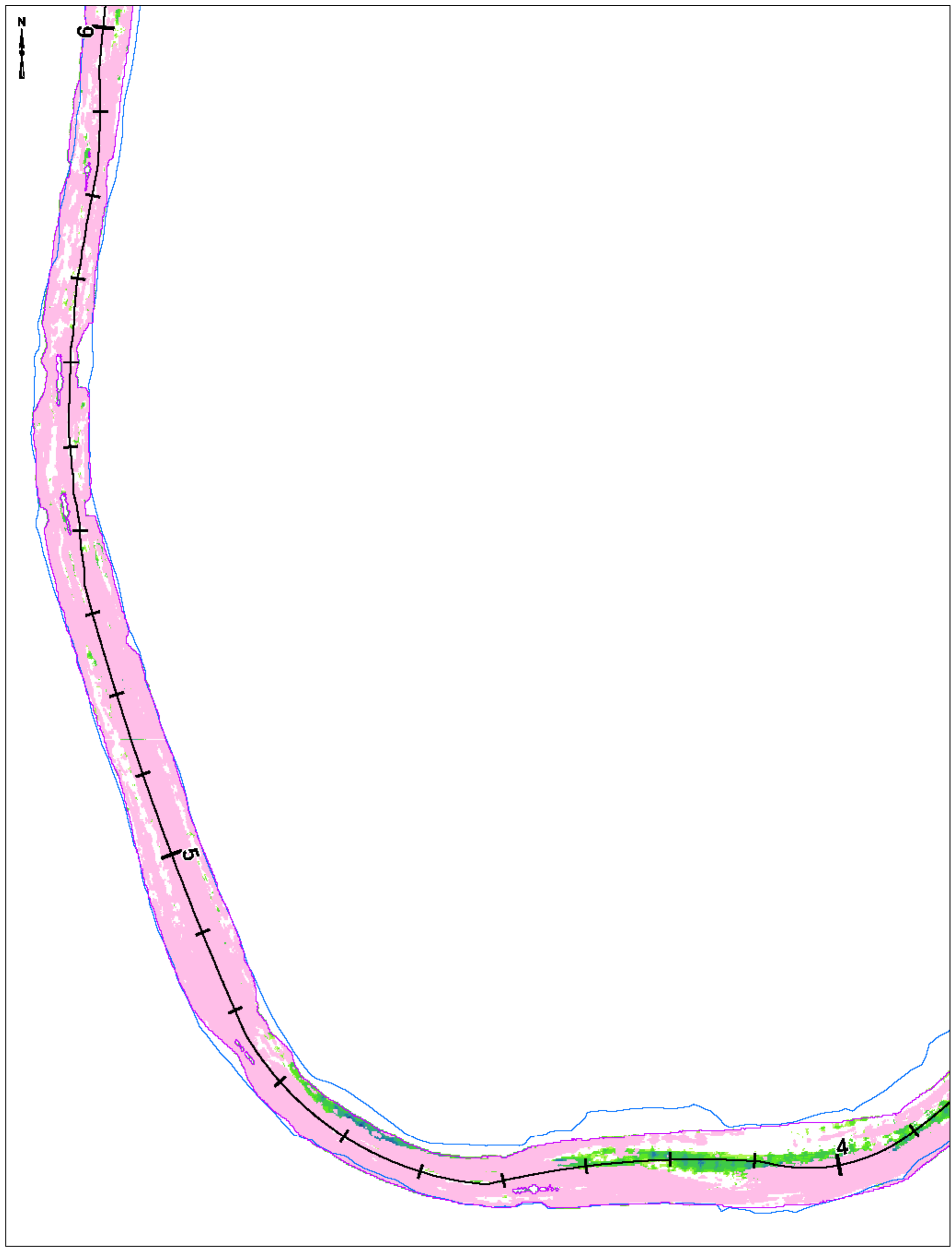


Conditional Simulation Results  
Count of Survey Pairs Showing Deposition with 95% Level of Confidence  
Lower Passaic River Restoration

Figure 11-28a  
2009



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### Legend

- Area Subject to Erosion (at least one 3 inch erosion event)

0 250 500 1,000 Feet

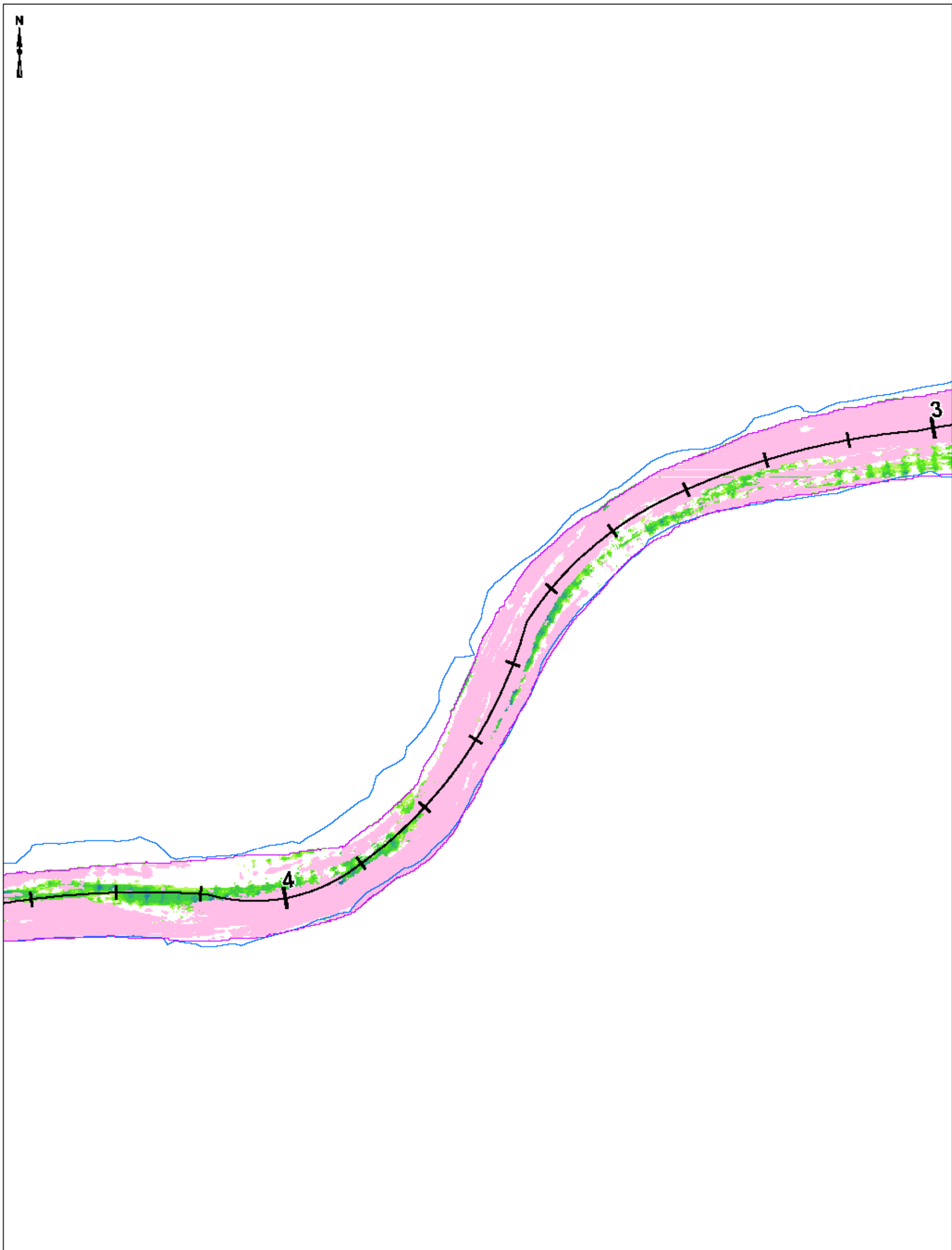
Note: The white areas within the simulation grid extent represents area where no erosional events were observed with a difference of 3 inches or more at a 70% level of confidence. These areas also had no observations of deposition with a 95% level of confidence.

#### Number of Depositional Observation with a 95% Level of Confidence

- 1
- 2 to 4
- 5 to 9
- 10 to 13
- 14 to 18
- 19 to 22
- ≥ 23

- Simulation Grid Extent
- Shoreline as defined by the NJDEP

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### Legend

Area Subject to Erosion (at least one 3 inch erosion event)

### Number of Depositional Observation with a 95% Level of Confidence



Note: The white areas within the simulation grid extent represents area where no erosional events were observed with a difference of 3 inches or more at a 70% level of confidence. These areas also had no observations of deposition with a 95% level of confidence.

Simulation Grid Extent  
Shoreline as defined by the NJDEP



Conditional Simulation Results  
Count of Survey Pairs Showing Deposition with 95% Level of Confidence  
Lower Passaic River Restoration

Figure 11-28c  
2009

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### Legend

● Area Subject to Erosion (at least one 3 inch erosion event)

**Number of Depositional Observation with a 95% Level of Confidence**

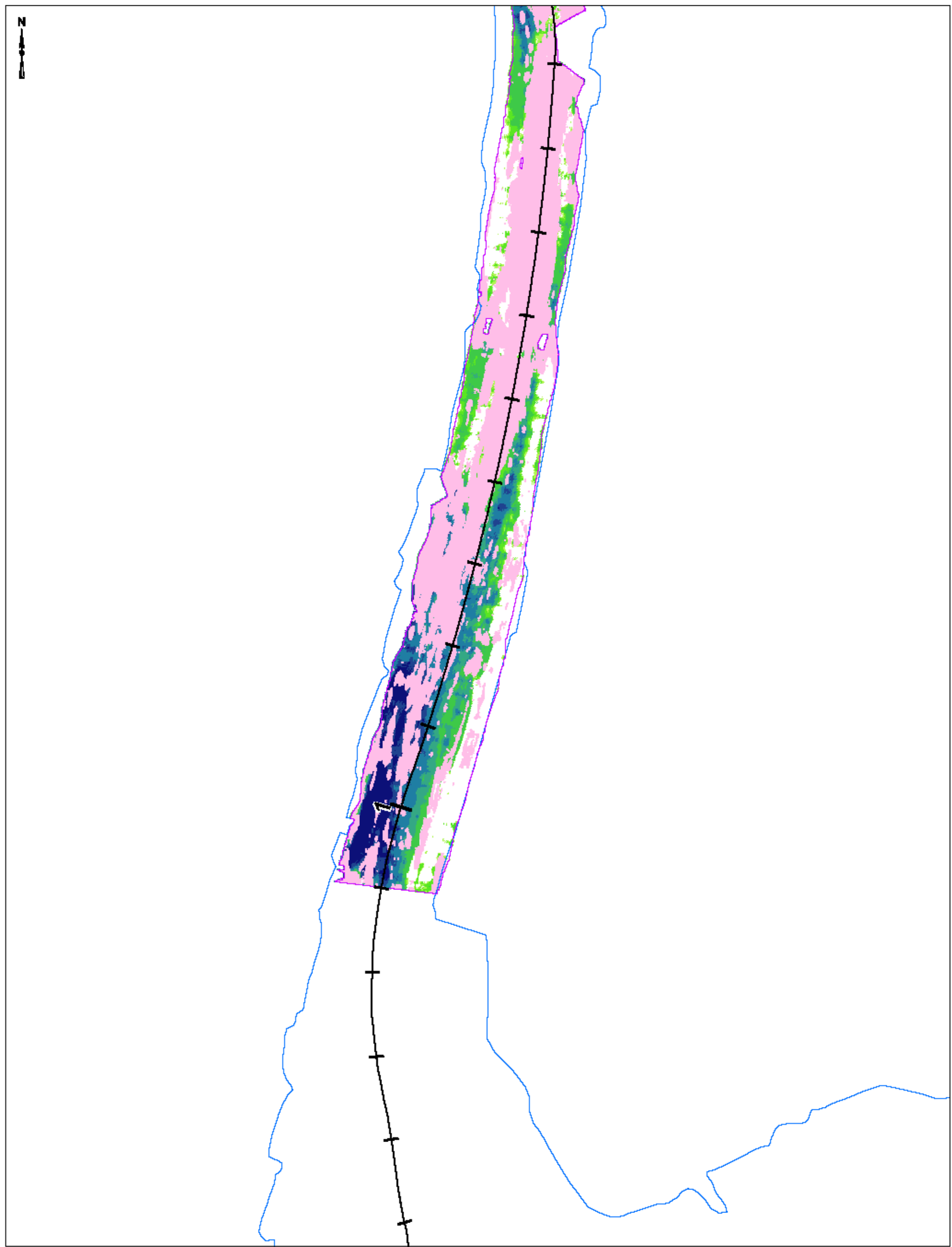
●	●	●	●	●	●	●
1	2 to 4	5 to 9	10 to 13	14 to 18	19 to 22	≥ 23

□ Simulation Grid Extent

— Shoreline as defined by the NJDEP

0 250 500 1,000 Feet

Note: The white areas within the simulation grid extent represents area where no erosional events were observed with a difference of 3 inches or more at a 70% level of confidence. These areas also had no observations of deposition with a 95% level of confidence.



### Legend

Area Subject to Erosion (at least one 3 inch erosion event)

**Number of Depositional Observation with a 95% Level of Confidence**

1

2 to 4

5 to 9

10 to 13

14 to 18

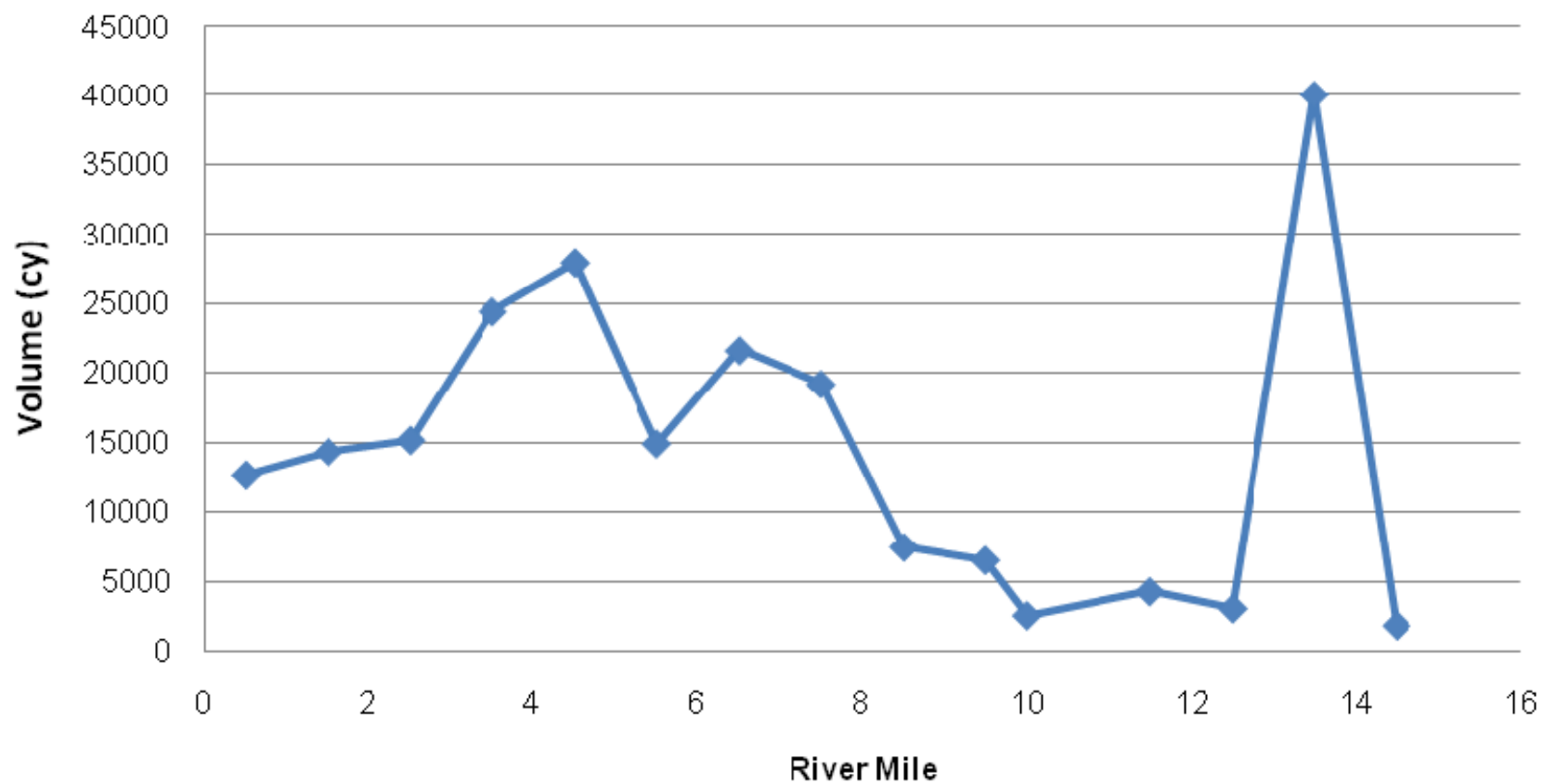
19 to 22

≥ 23

Simulation Grid Extent

Shoreline as defined by the NJDEP

Note: The white areas within the simulation grid extent represents area where no erosional events were observed with a difference of 3 inches or more at a 70% level of confidence. These areas also had no observations of deposition with a 95% level of confidence.



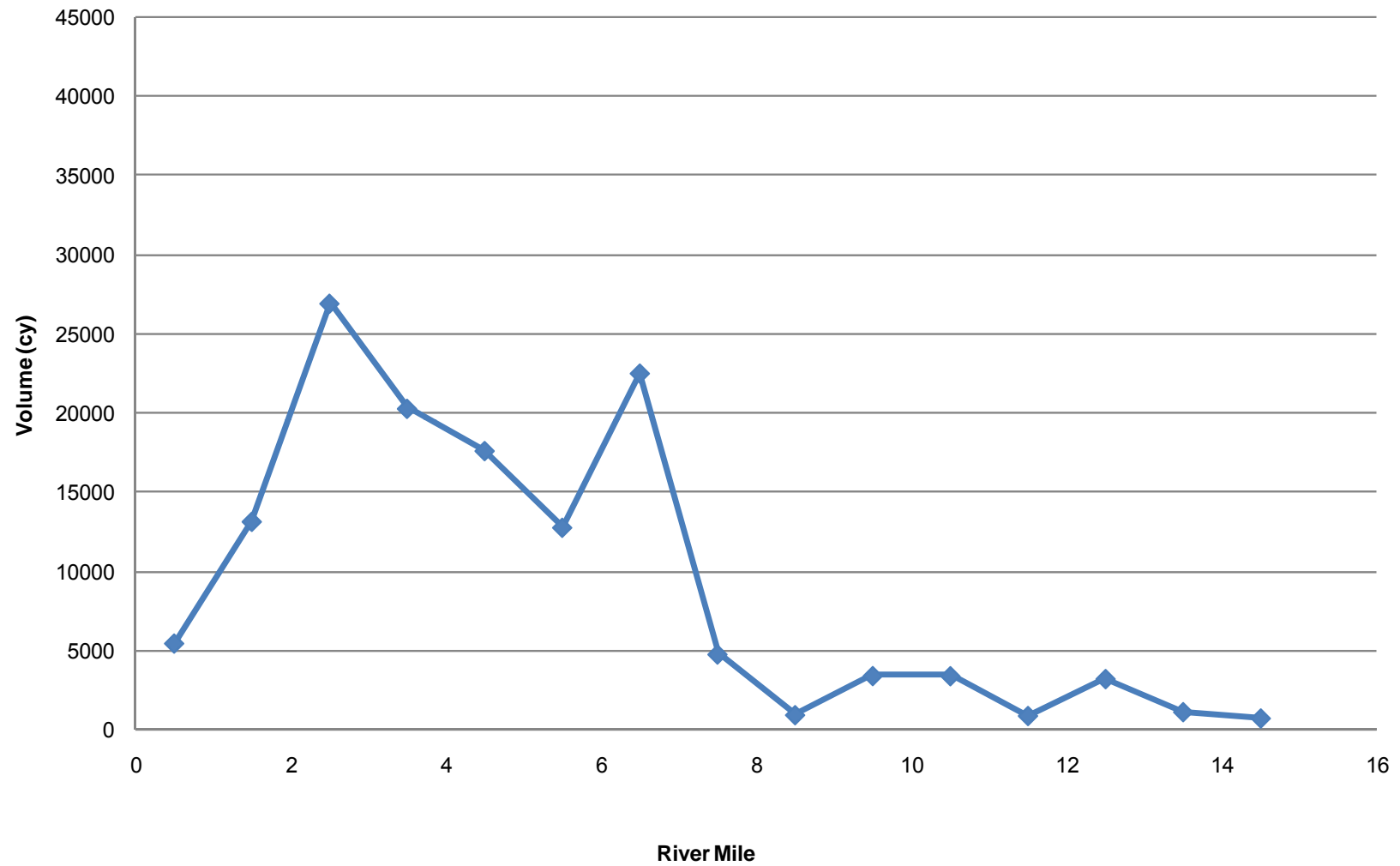
**Fine Grained Sediment Volume Resuspended by River Mile  
Scenerio 1, 1989-2007**

*Lower Passaic River Restoration Project*

**Figure 11-29**

2009



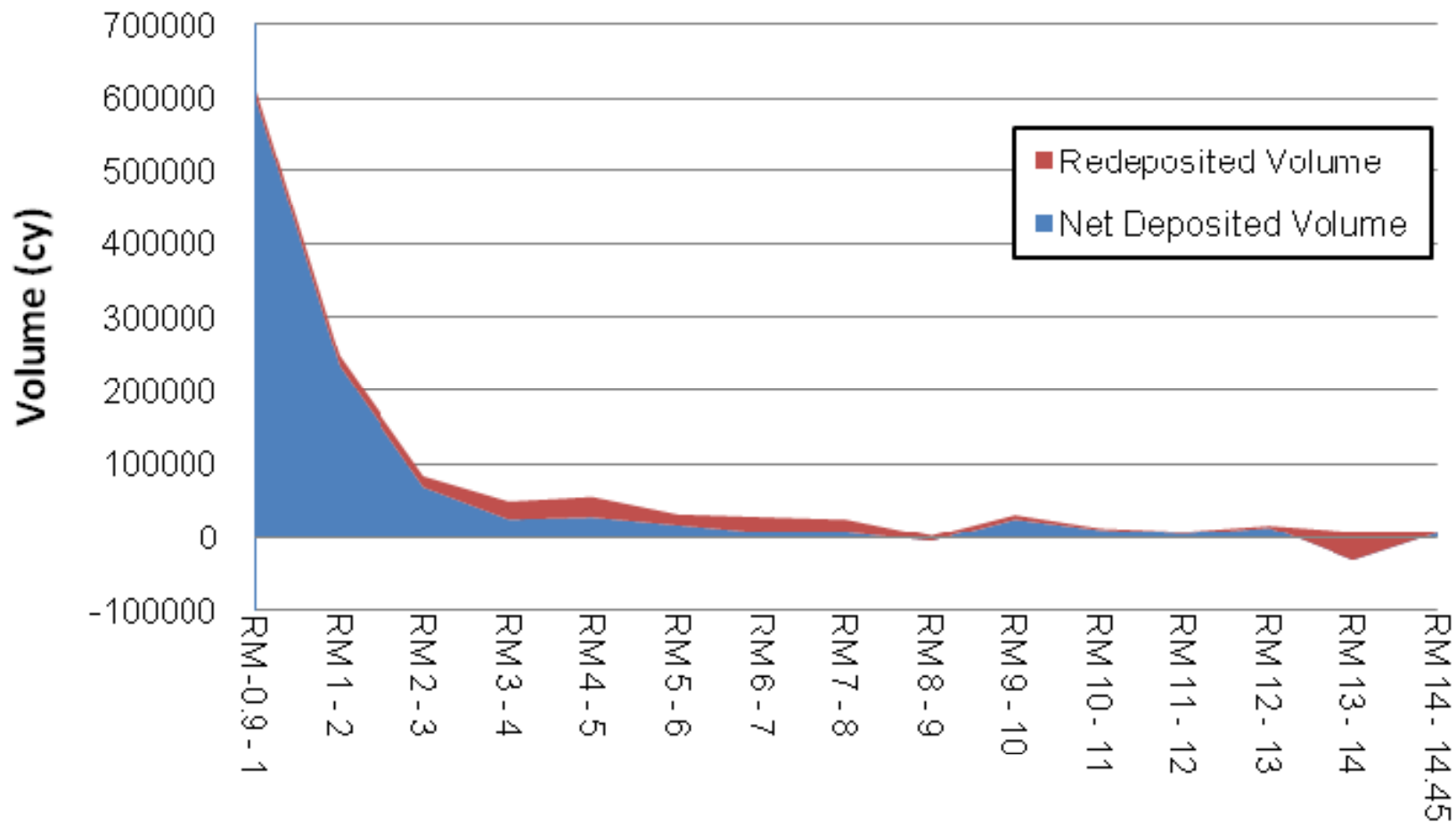


Fine Grained Sediment Volume Resuspended by River Mile  
Scenario 1 2004-2007

*Lower Passaic River Restoration Project*

Figure 11-30

2009

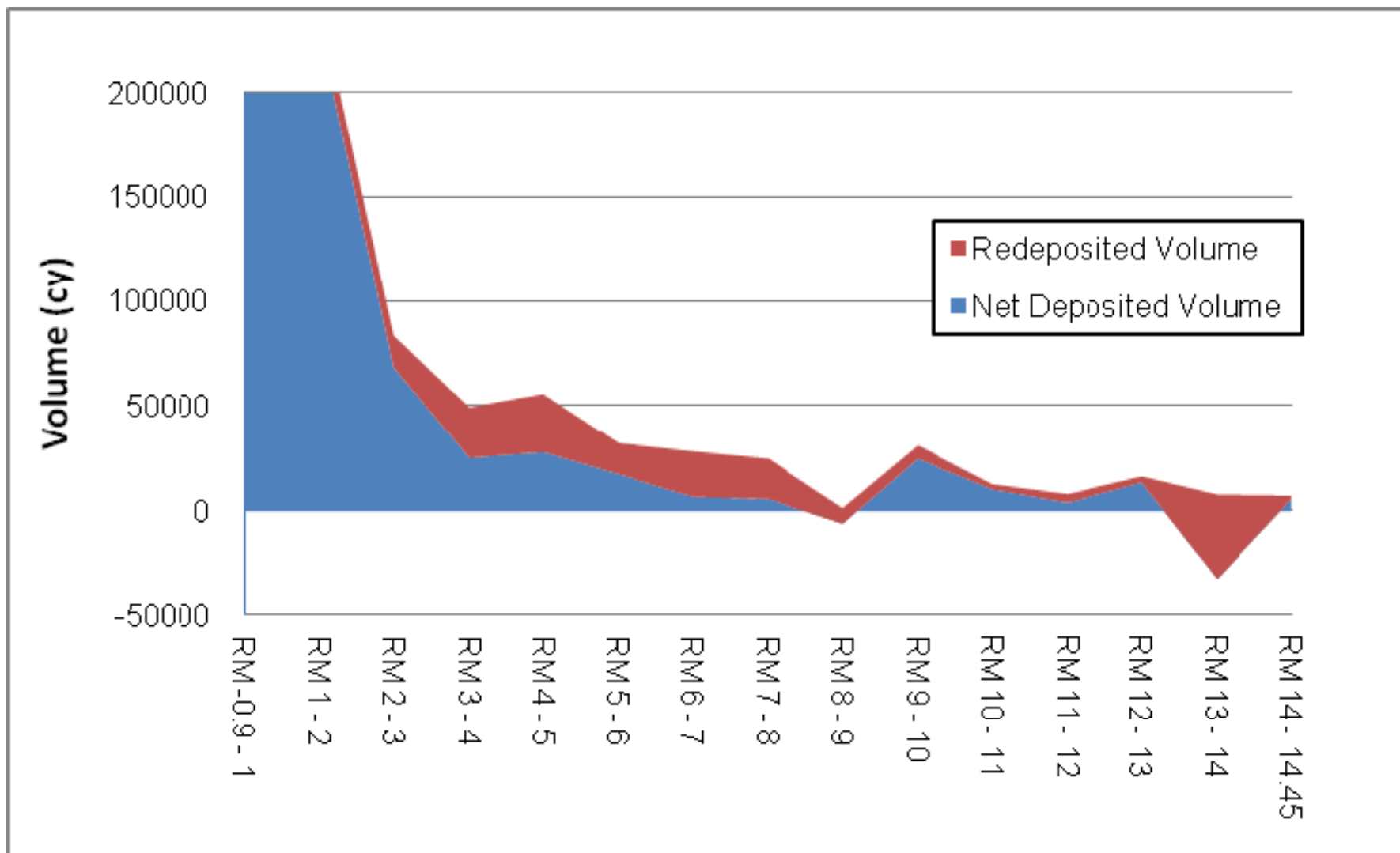


Fine Grained Sediment Deposition  
1989 to 2007

*Lower Passaic River Restoration Project*

Figure 11-31

2009

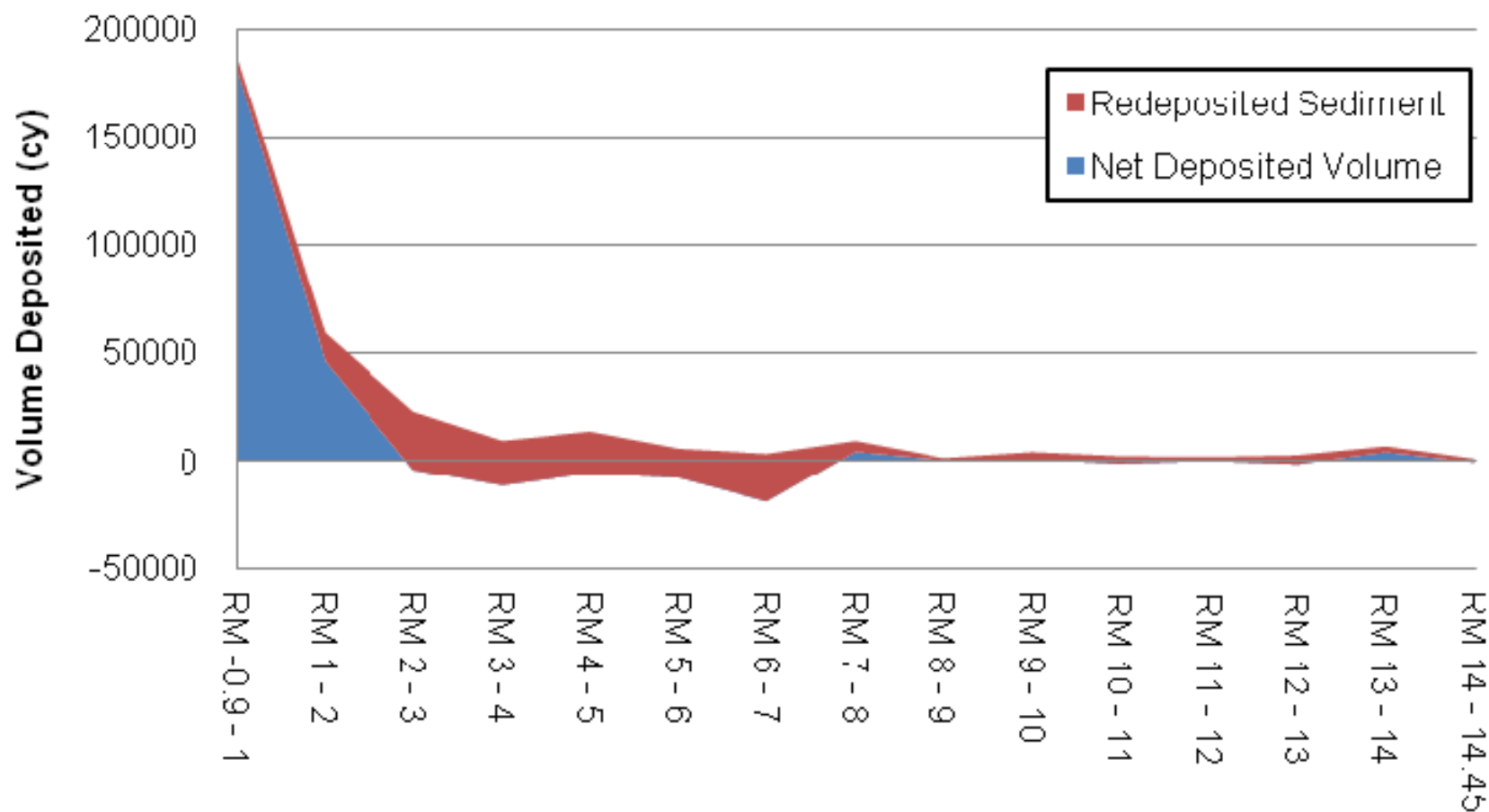


**Fine Grained Sediment Deposition  
1989 to 2007- Expanded Scale**

*Lower Passaic River Restoration Project*

**Figure 11-32**

2009

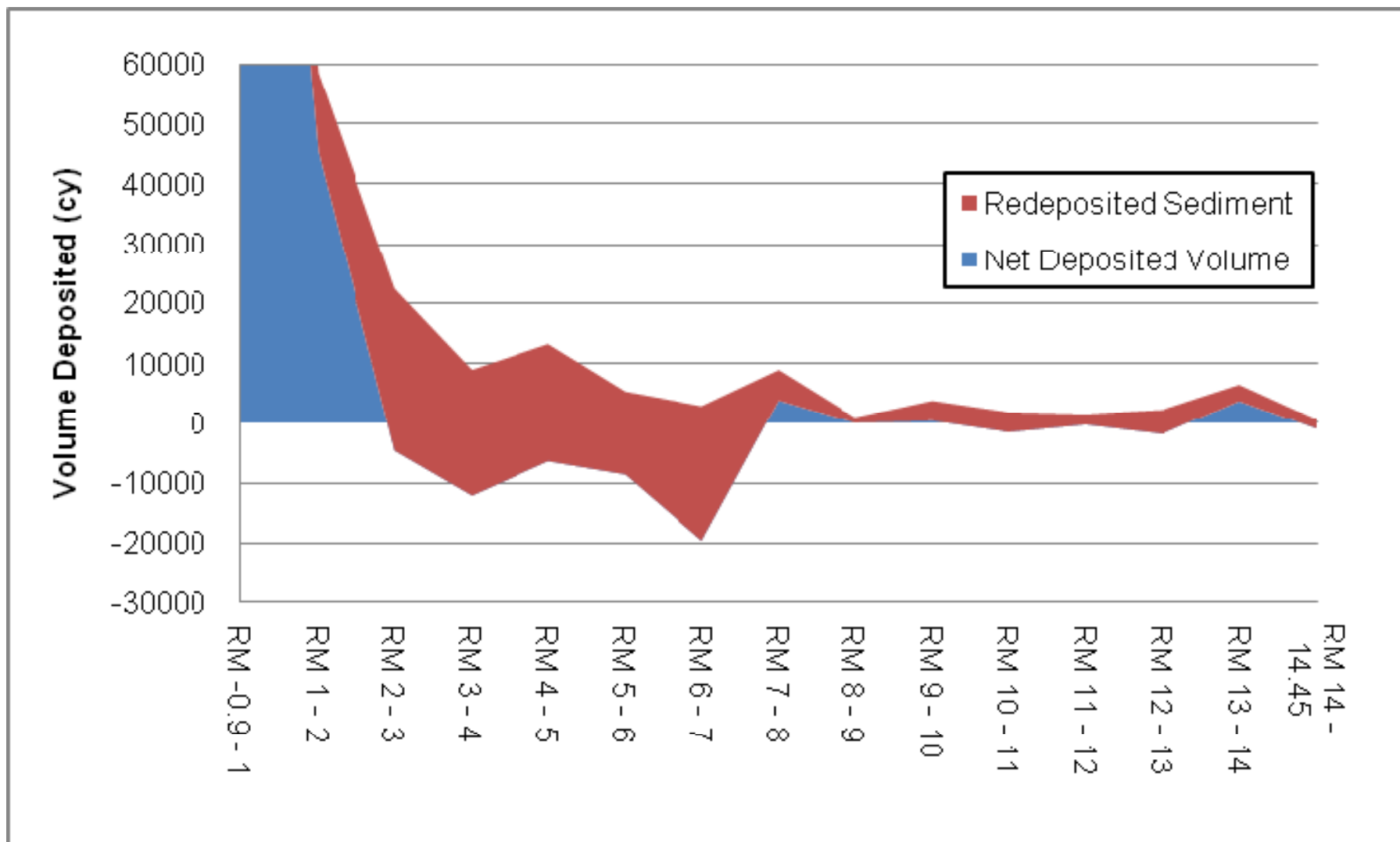


**Fine Grained Sediment Deposition  
2004 to 2007**

*Lower Passaic River Restoration Project*

**Figure 11-33**

2009



**Fine Grained Sediment Deposition  
2004 to 2007: Expanded Scale**

*Lower Passaic River Restoration Project*

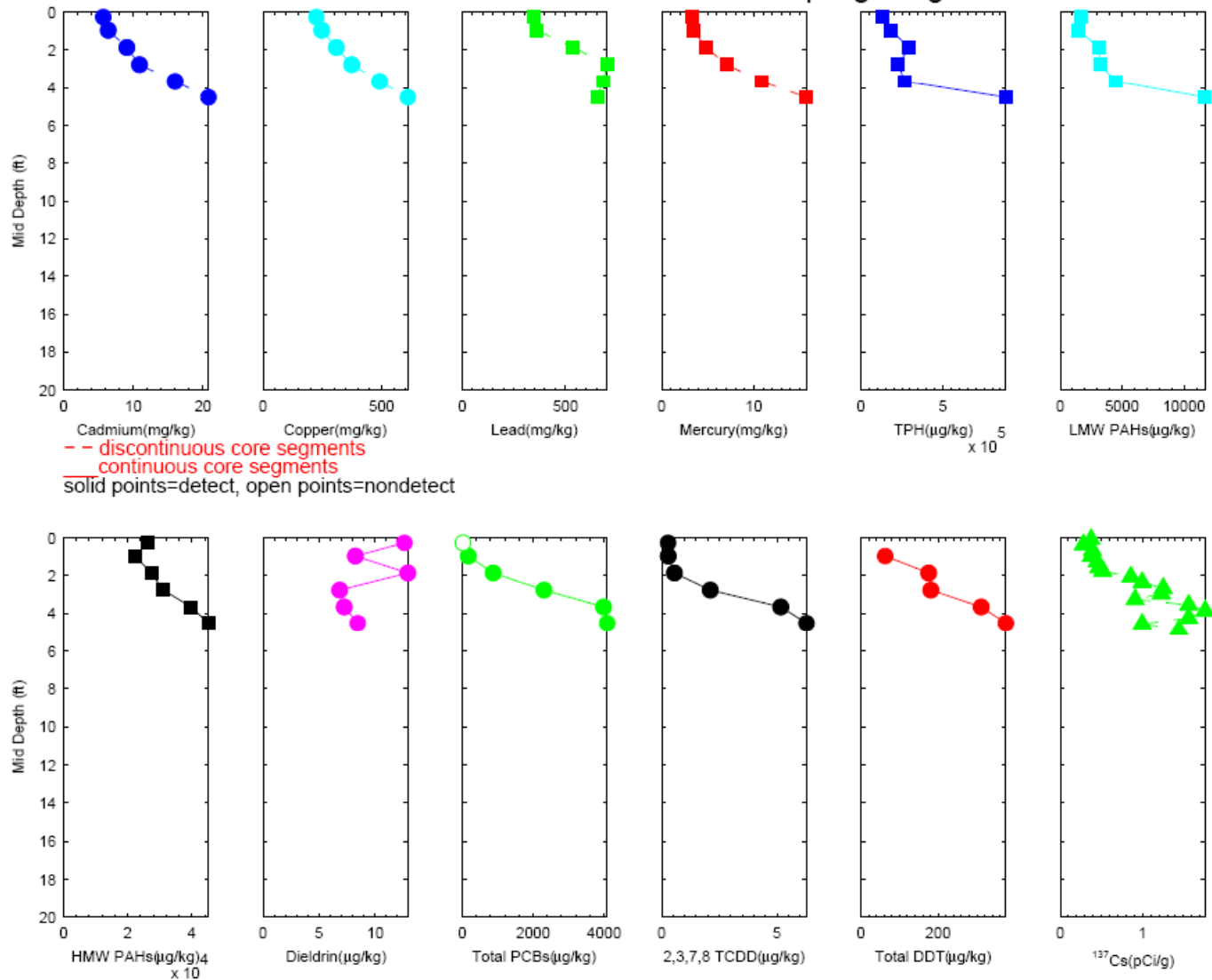
**Figure 11-34**

2009



Sample ID: 229 River Mile 3.08

PASSAIC 1995 RI Sampling Program



Core Classified as Having a Generally Depositional Setting (229)

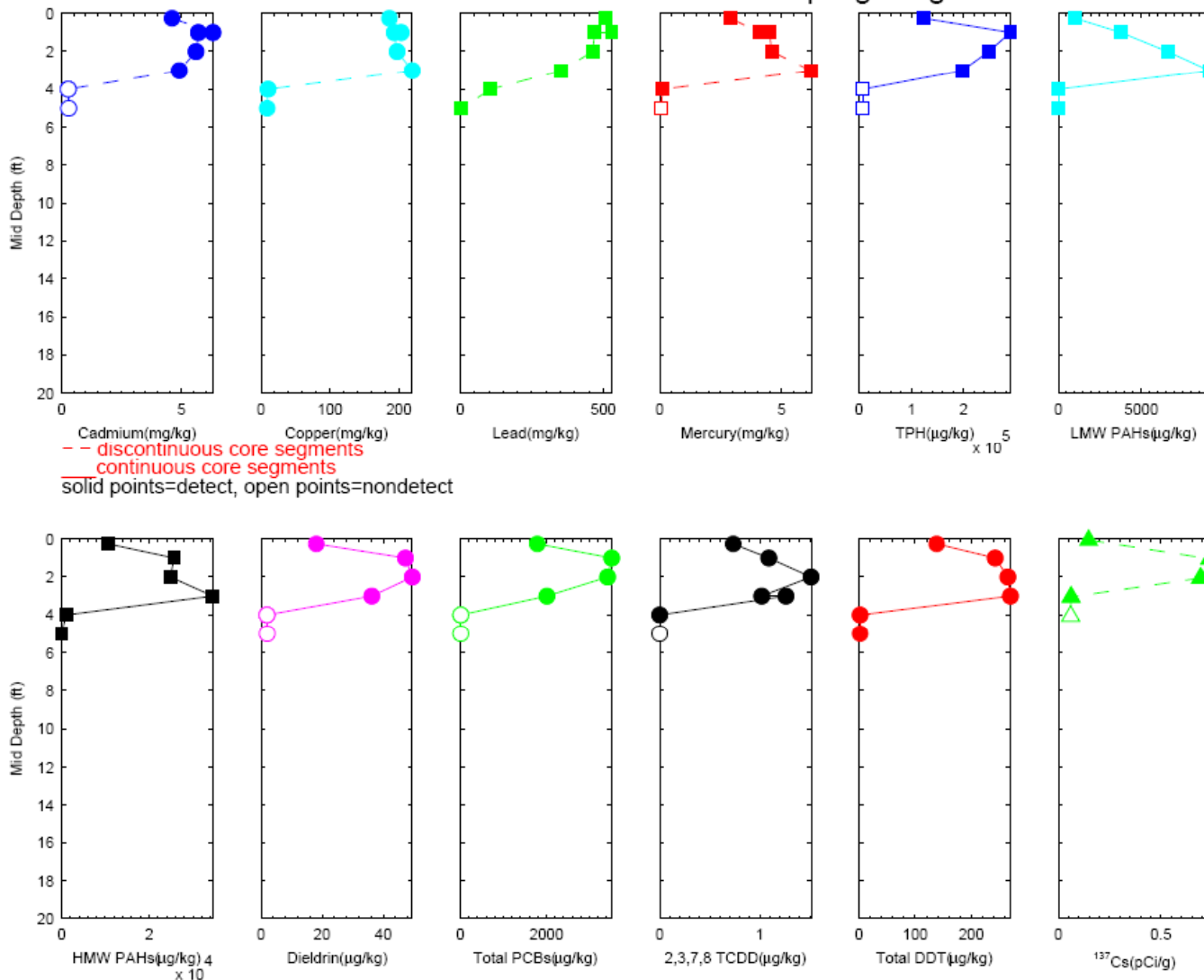
Lower Passaic River Restoration Project

Figure 11-35

2009

Sample ID: 268 River Mile 5.96

PASSAIC 1995 RI Sampling Program



Core Classified as Recently Depositional (268)

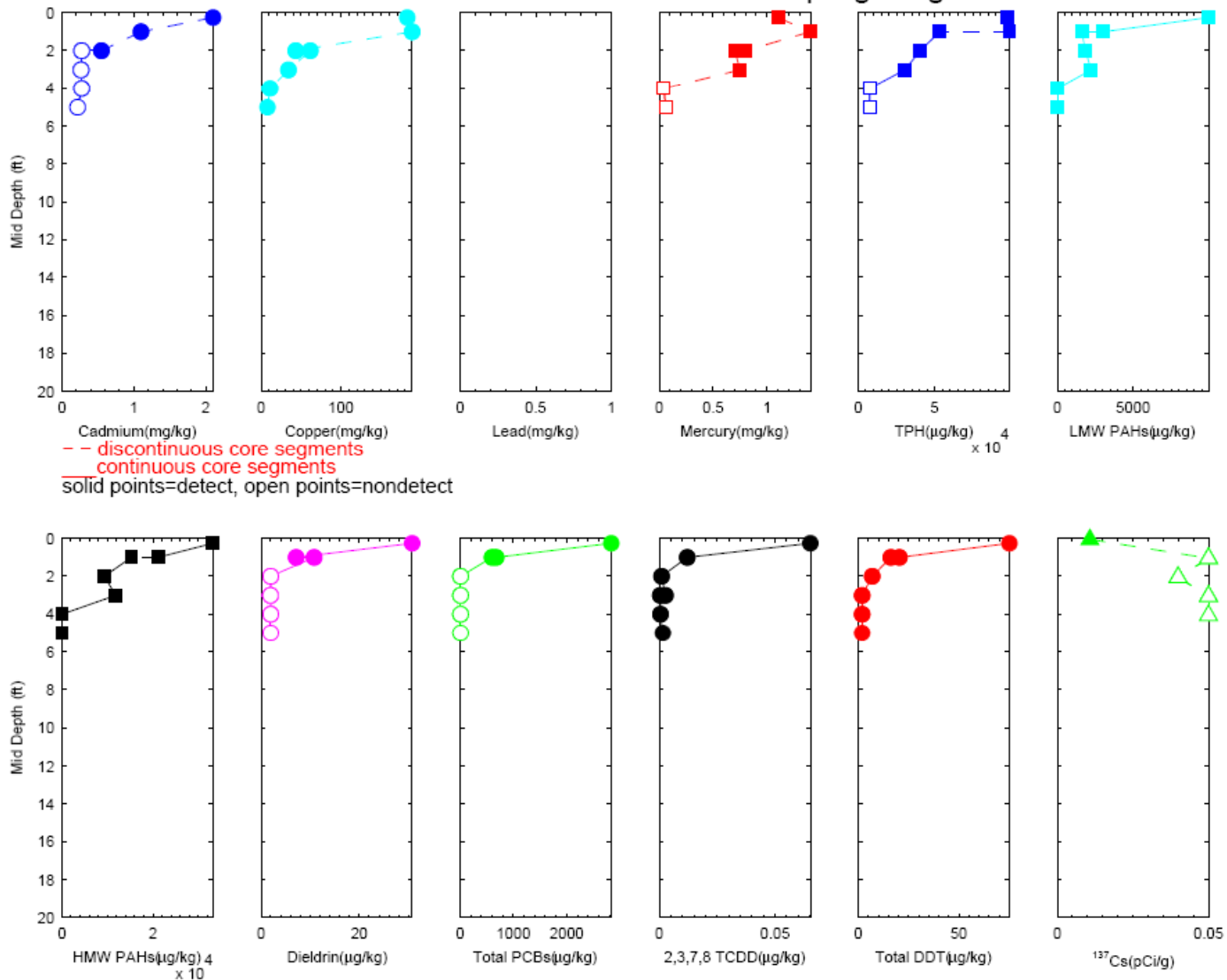
Lower Passaic River Restoration Project

Figure 11-36

2009

Sample ID: 264 River Mile 5.74

PASSAIC 1995 RI Sampling Program



Core Classified as Non-Depositional (264)

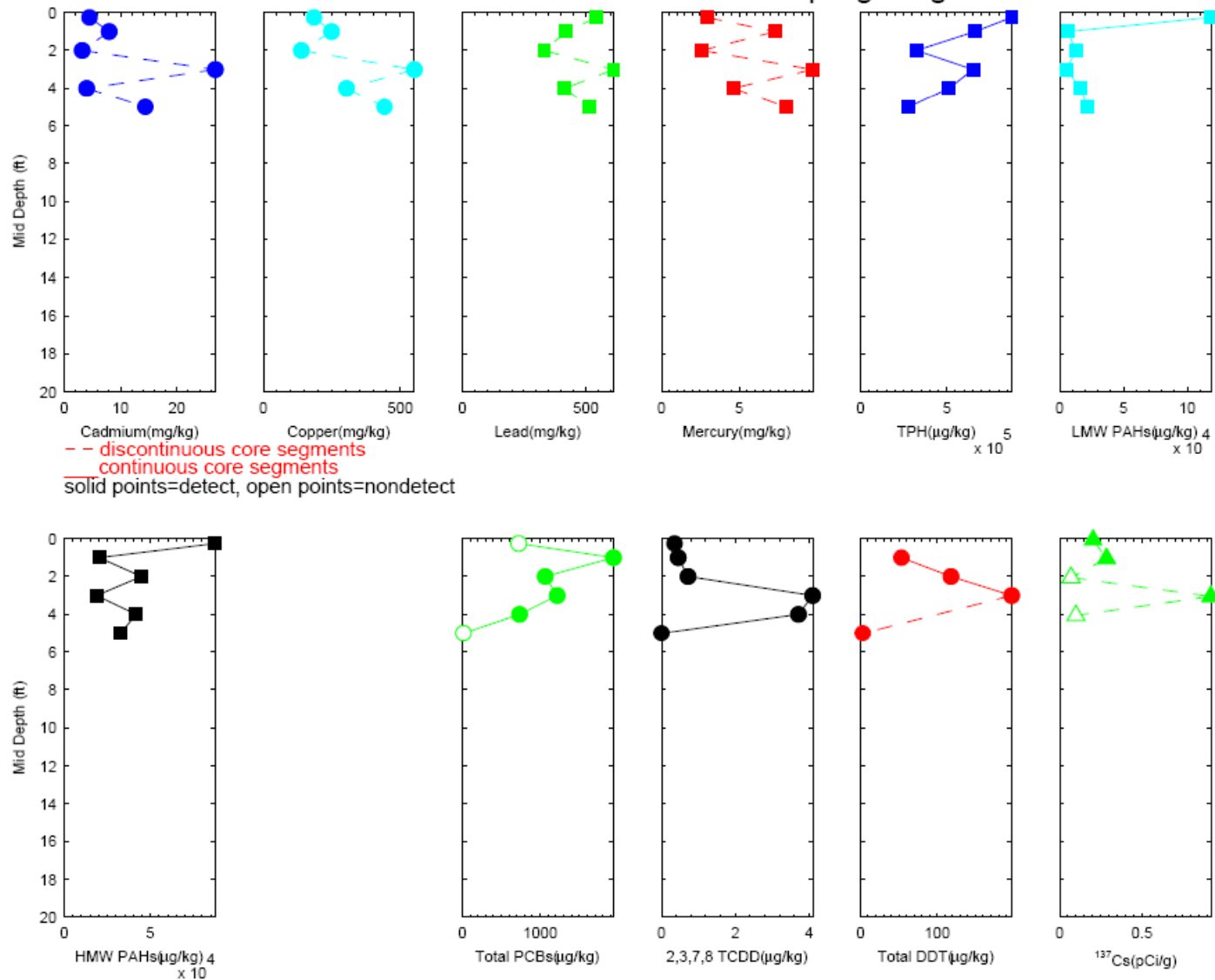
Lower Passaic River Restoration Project

Figure 11-37

2009

Sample ID: 244 River Mile 4.23

PASSAIC 1995 RI Sampling Program



Core Classified as Erosive (244)

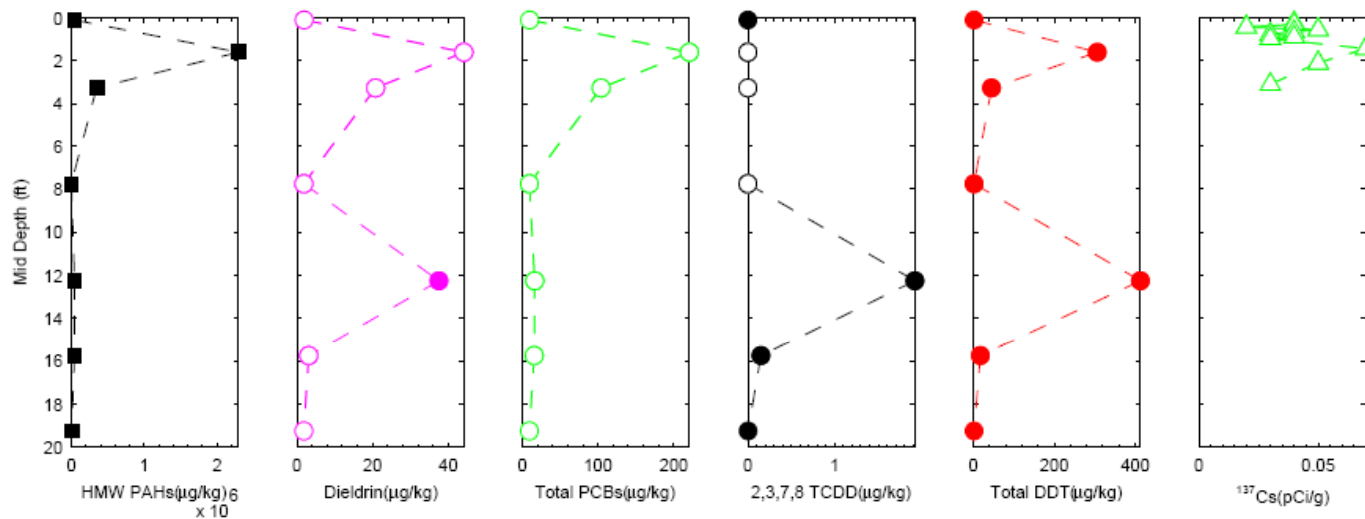
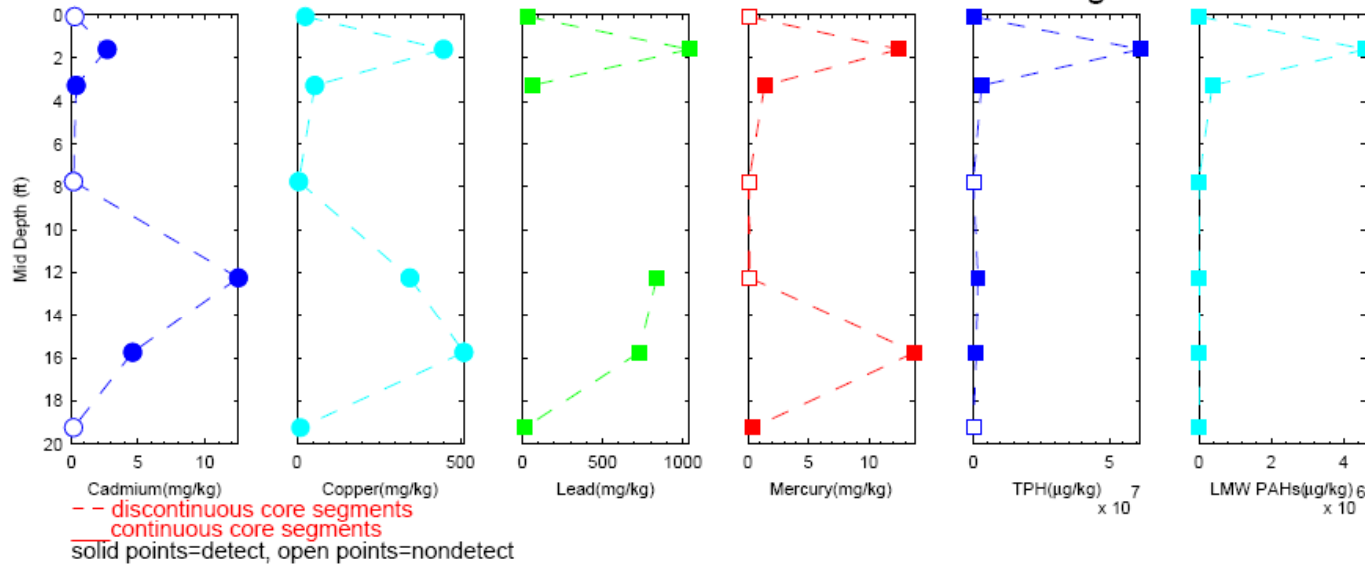
Lower Passaic River Restoration Project

Figure 11-38

2009

Sample ID: 20A River Mile 3.05

PASSAIC 1991 Core Sediment Investigation



Core Classified as Unclassifiable (20A)

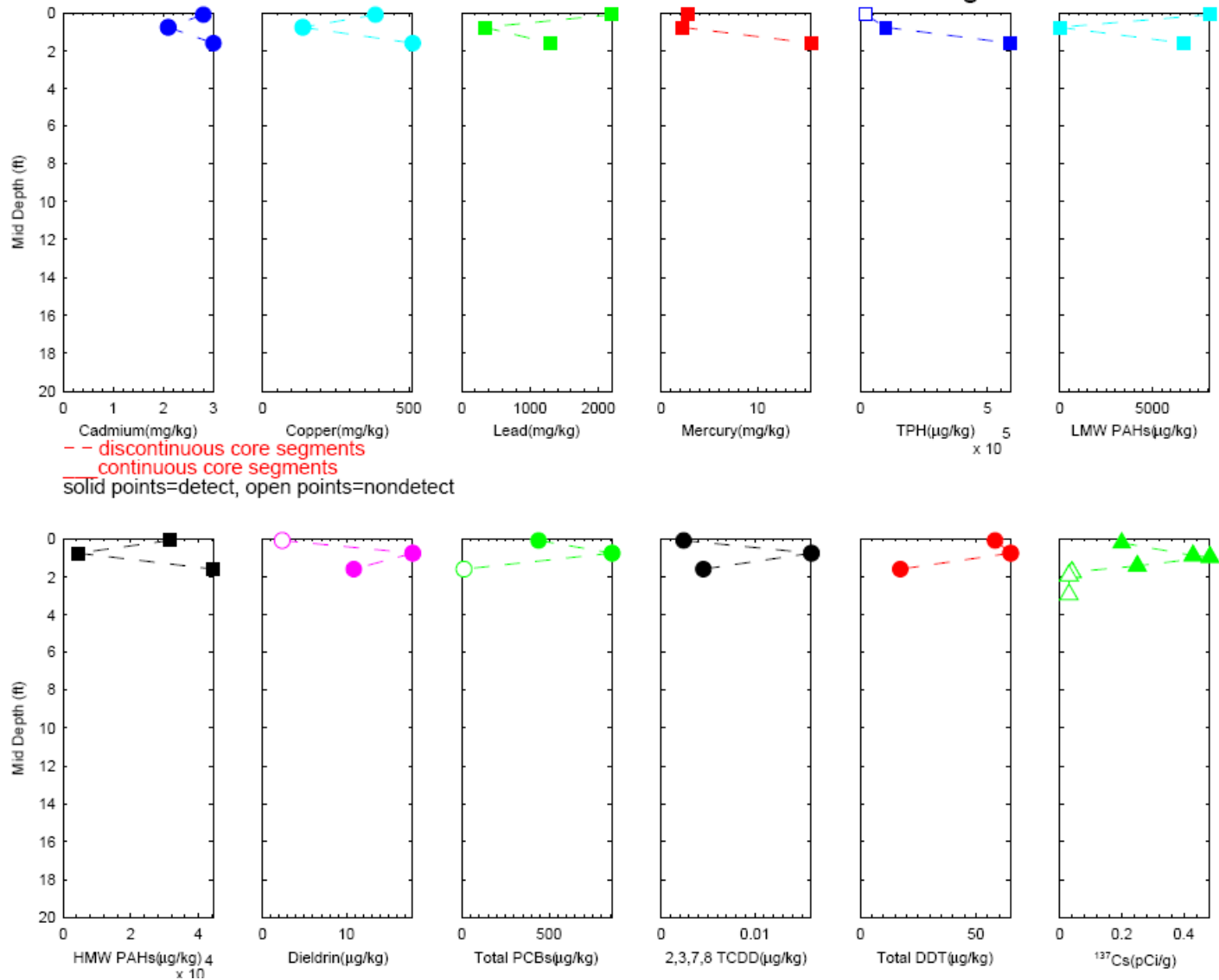
Lower Passaic River Restoration Project

Figure 11-39

2009

Sample ID: 02A River Mile 16.95

PASSAIC 1991 Core Sediment Investigation



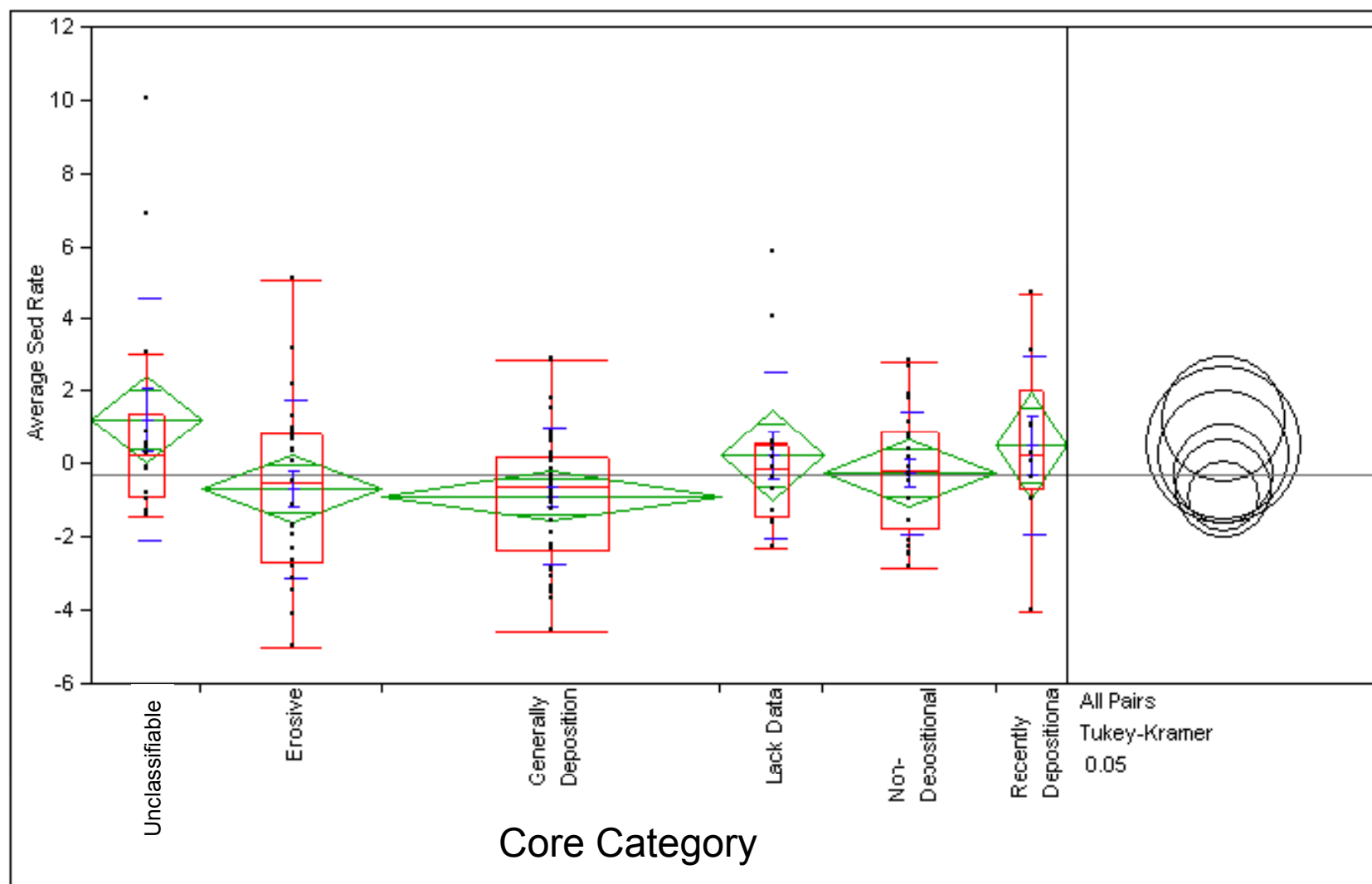
Core Classified as Lack Data (02A)

Lower Passaic River Restoration Project

Figure 11-40

2009





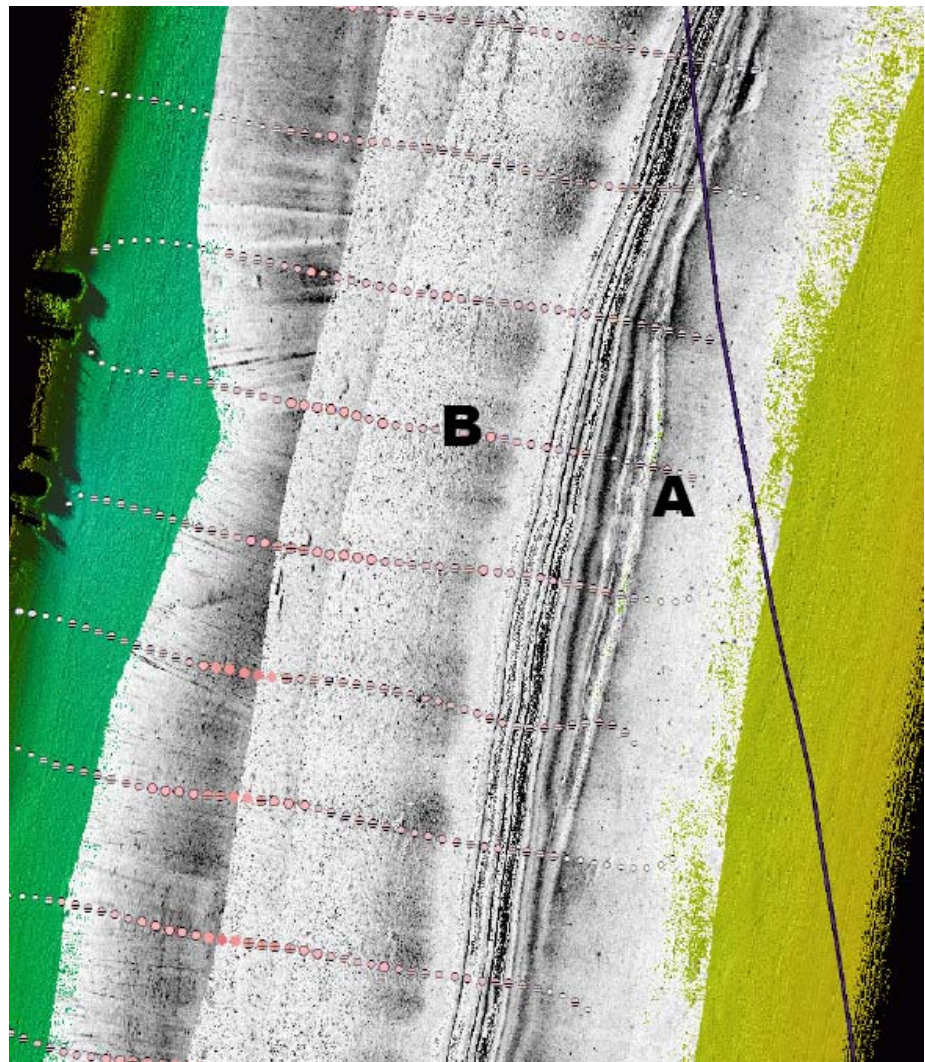
Comparison of Deposition Rates by Sediment Core Class  
Deposition Rate based on 1989 to 2007 Bathymetric Surveys

*Lower Passaic River Restoration Project*

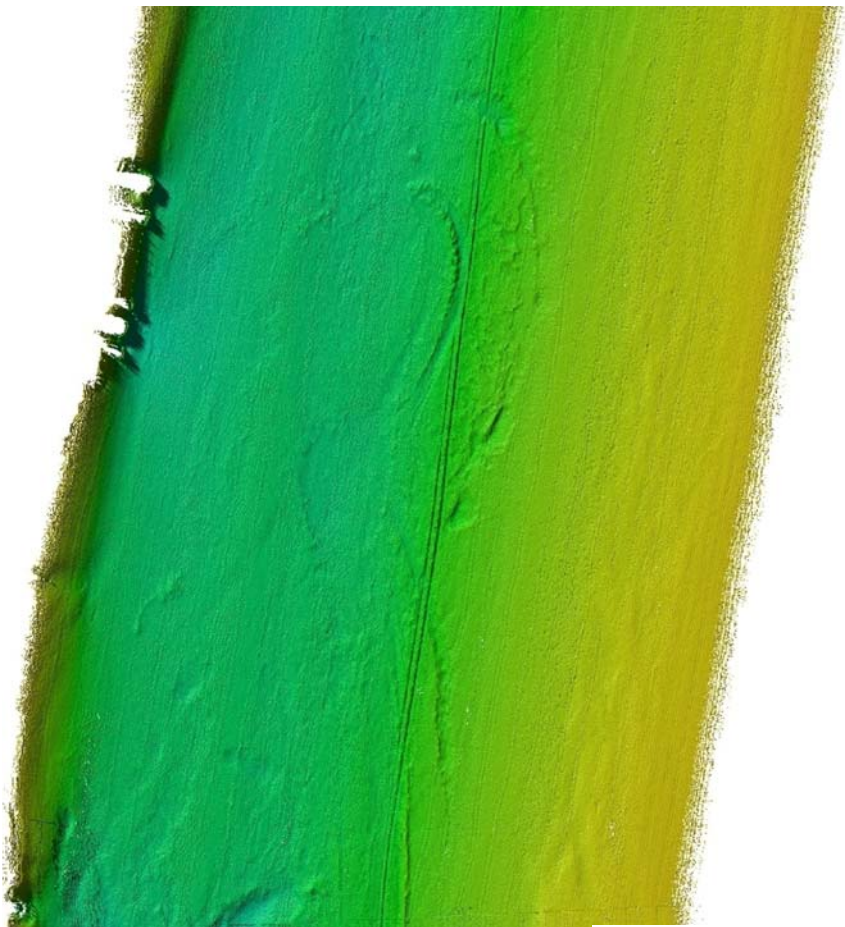
Figure 11-41

2009

2005 Side Scan SONAR



2007 Multi-Beam Bathymetry Aspect



0 50 100  
Feet



2005 Side Scan SONAR and Aspect of 2007 Multi-Beam Data at RM0.67

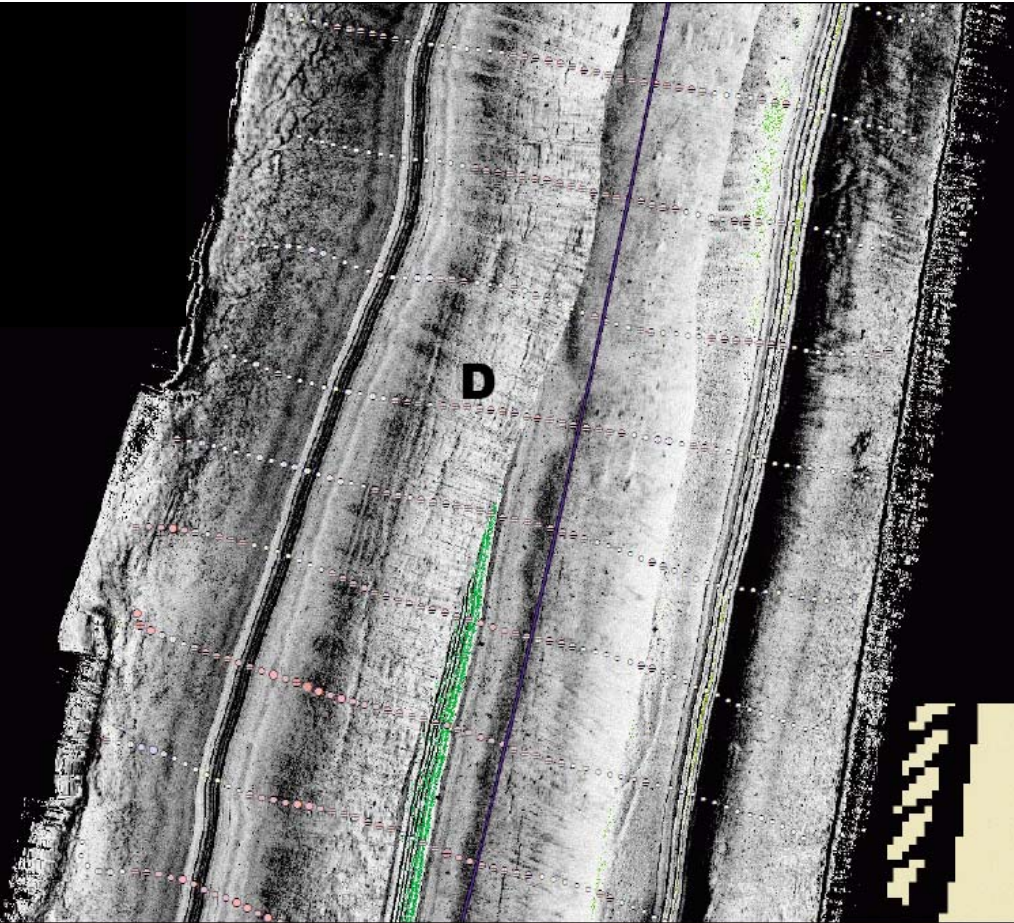
*Lower Passaic River Restoration Project*

Figure 11-42

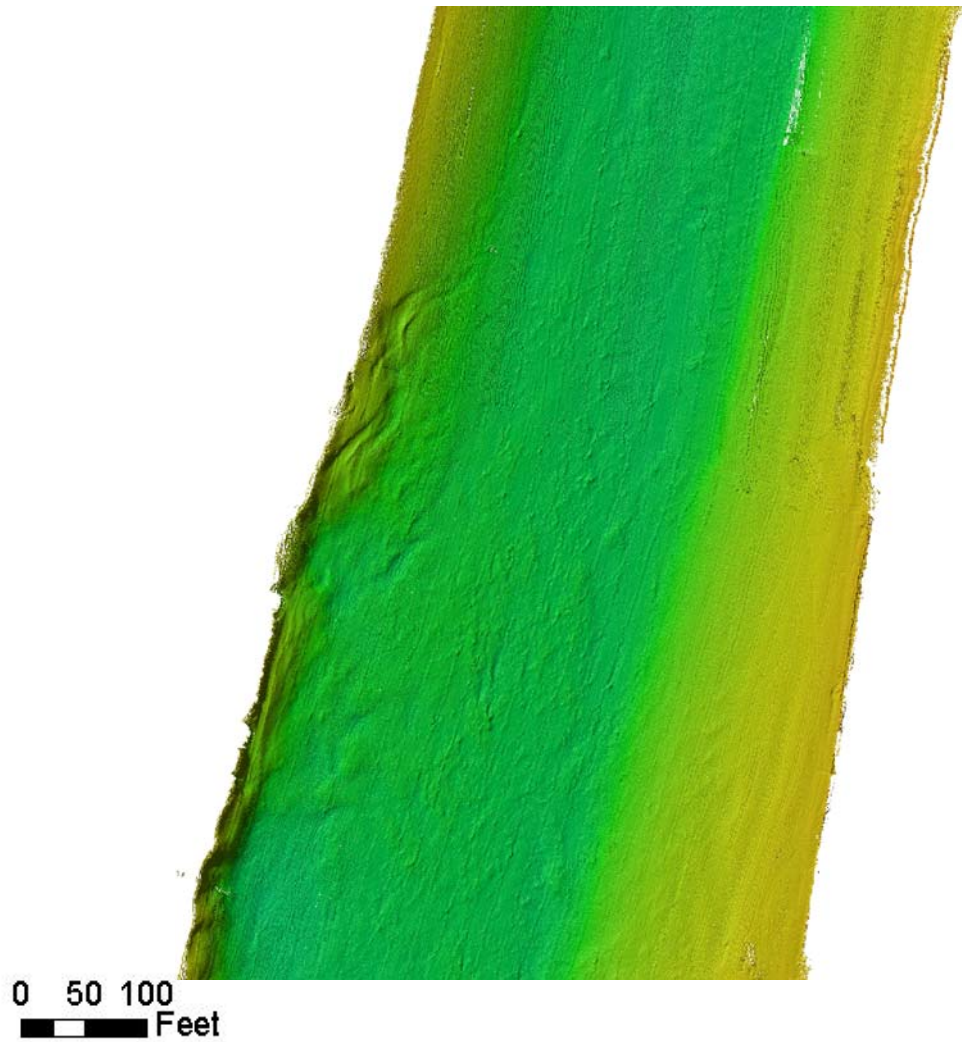
2009



2005 Side Scan SONAR



2007 Multi-Beam Bathymetry Aspect



0 50 100  
Feet



2005 Side Scan SONAR and Aspect of 2007 Multi-Beam Data at RM1.41

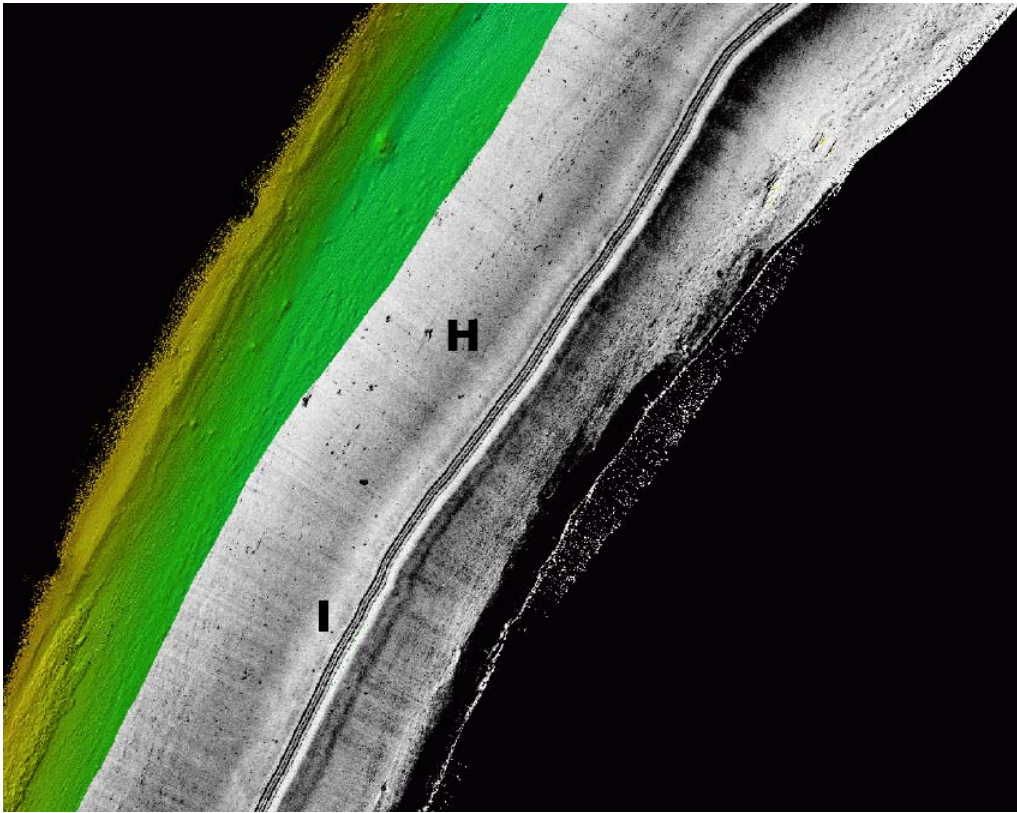
*Lower Passaic River Restoration Project*

Figure 11-43

2009

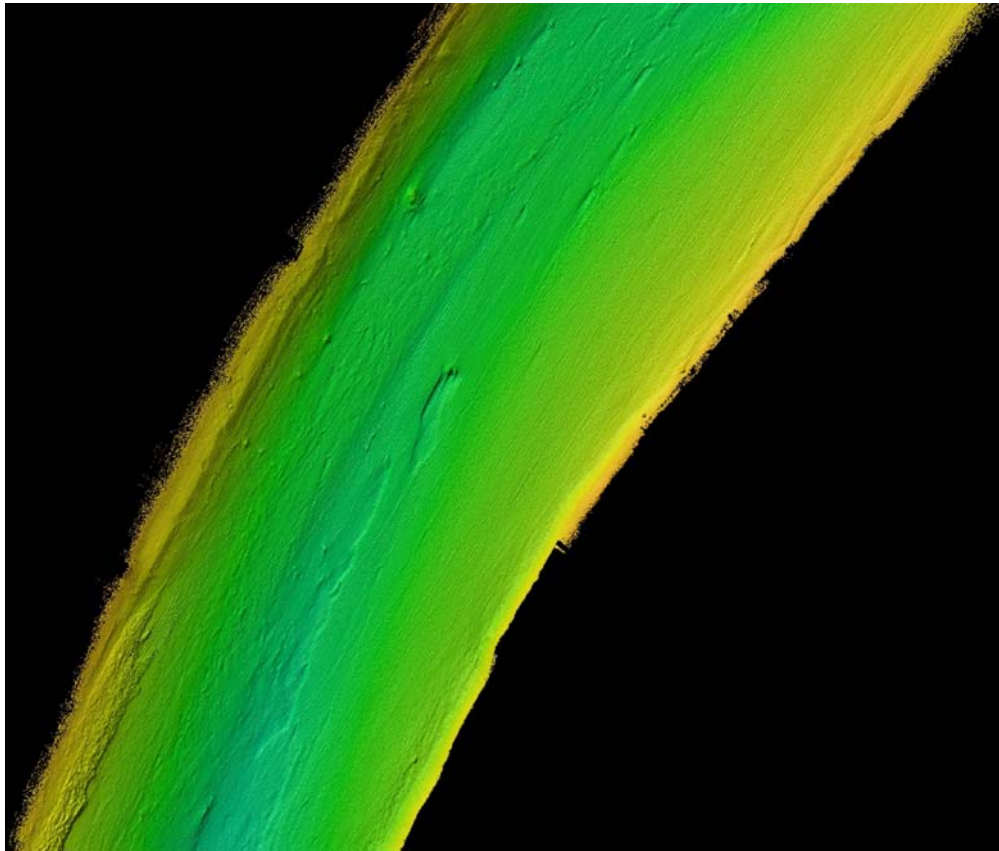


2005 Side Scan SONAR



0 50 100  
Feet

2007 Multi-Beam Bathymetry Aspect



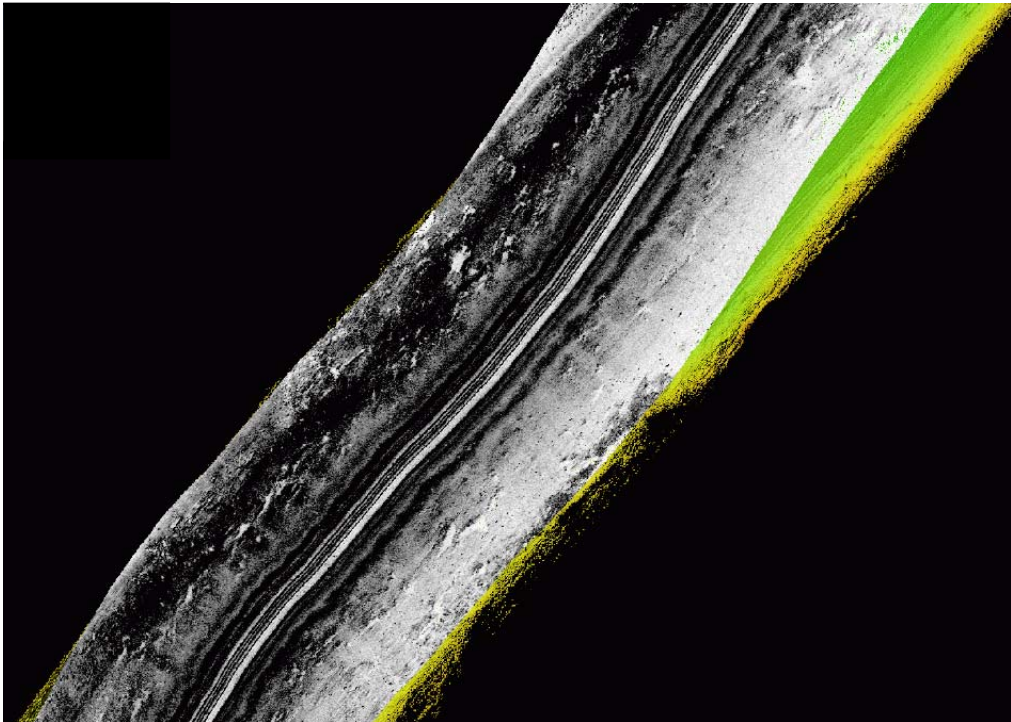
2005 Side Scan SONAR and Aspect of 2007 Multi-Beam Data at RM3.58

*Lower Passaic River Restoration Project*

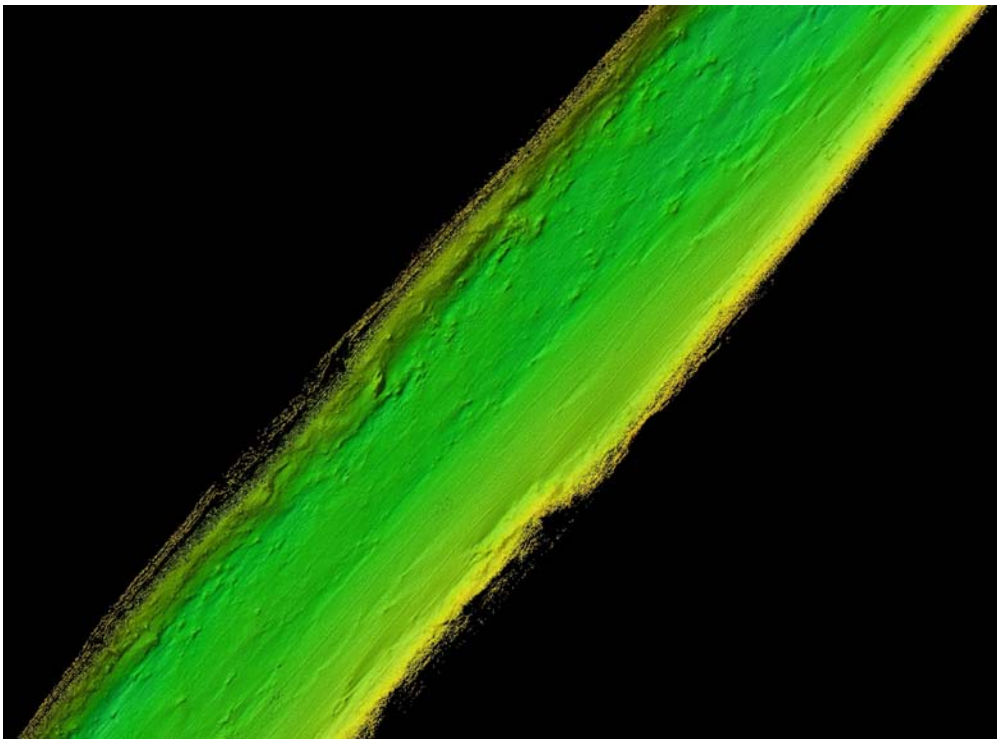
Figure 11-44

2009

2005 Side Scan SONAR



2007 Multi-Beam Bathymetry Aspect



0 75 150  
Feet



2005 Side Scan SONAR and Aspect of 2007 Multi-Beam Data at RM7.53

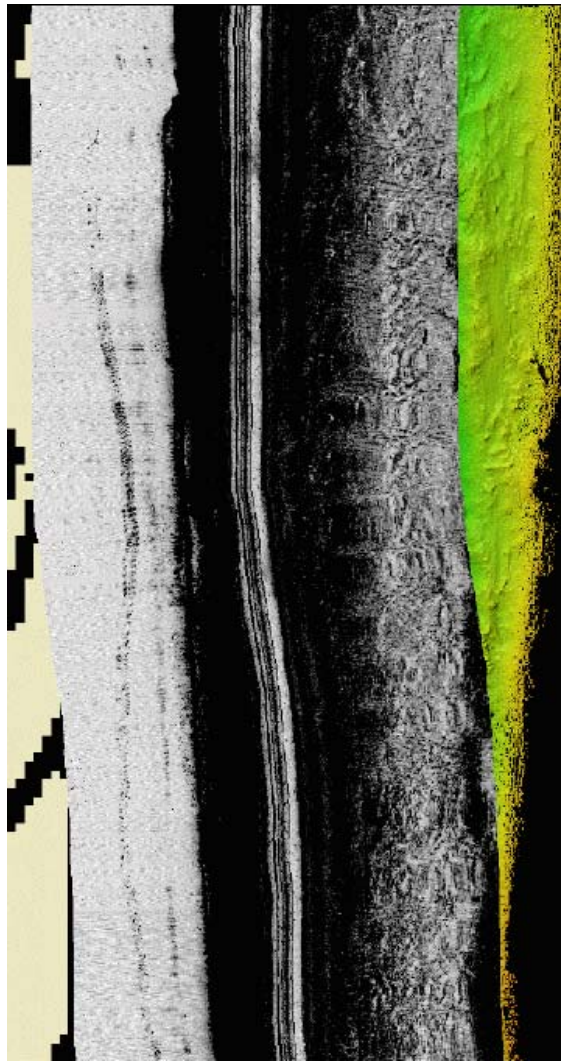
*Lower Passaic River Restoration Project*

Figure 11-45

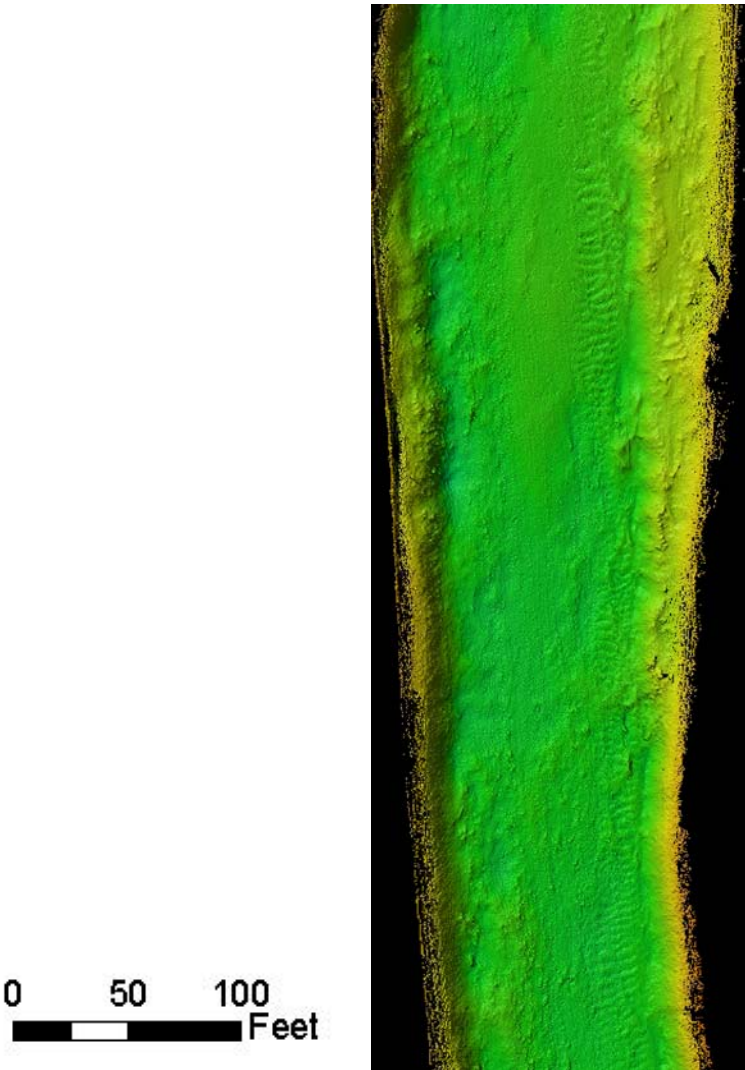
2009



2005 Side Scan SONAR



2007 Multi-Beam Bathymetry Aspect



0 50 100 Feet



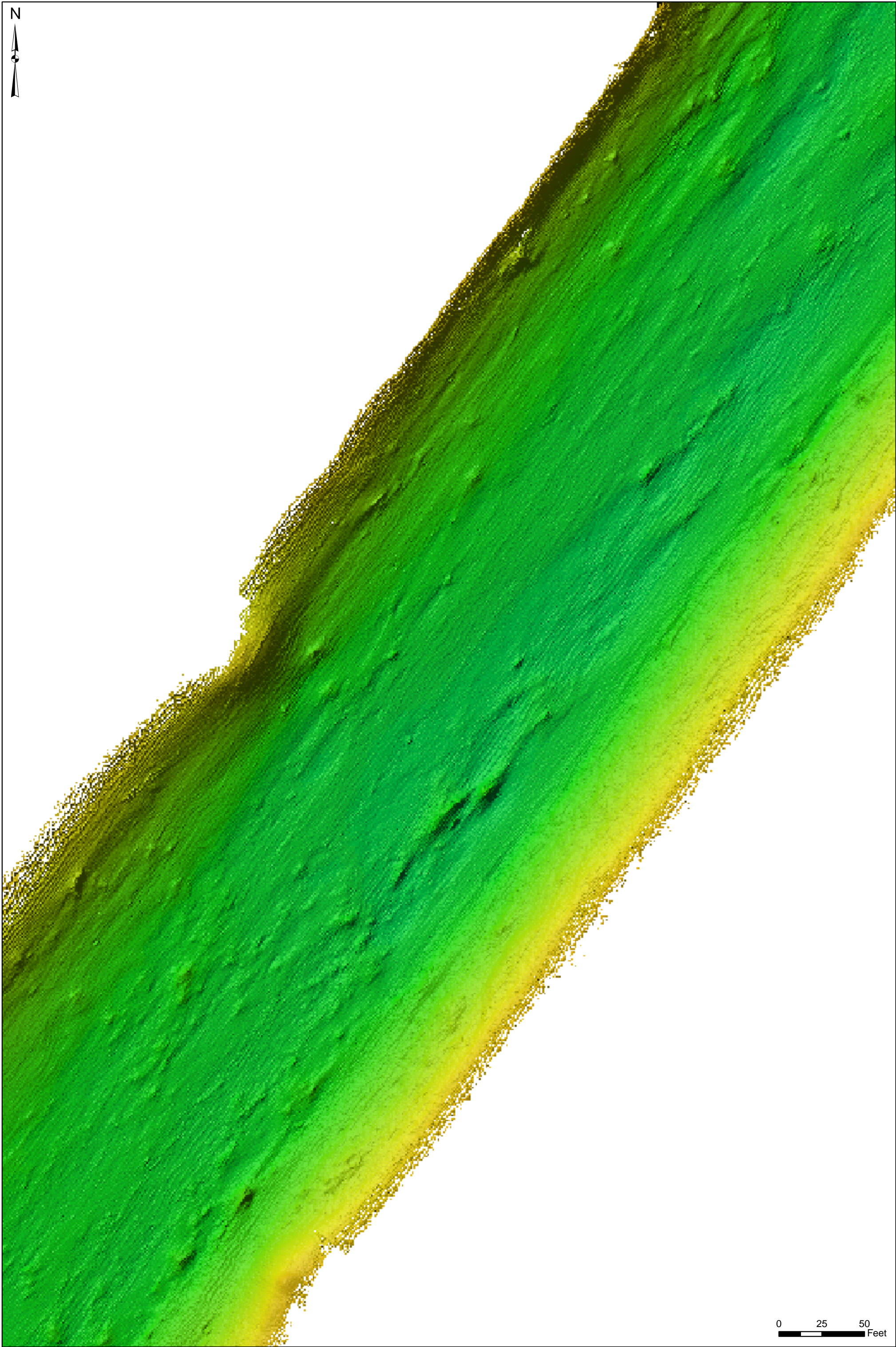
2005 Side Scan SONAR and Aspect of 2007 Multi-Beam Data at RM8.3

Lower Passaic River Restoration Project

Figure 11-46

2009



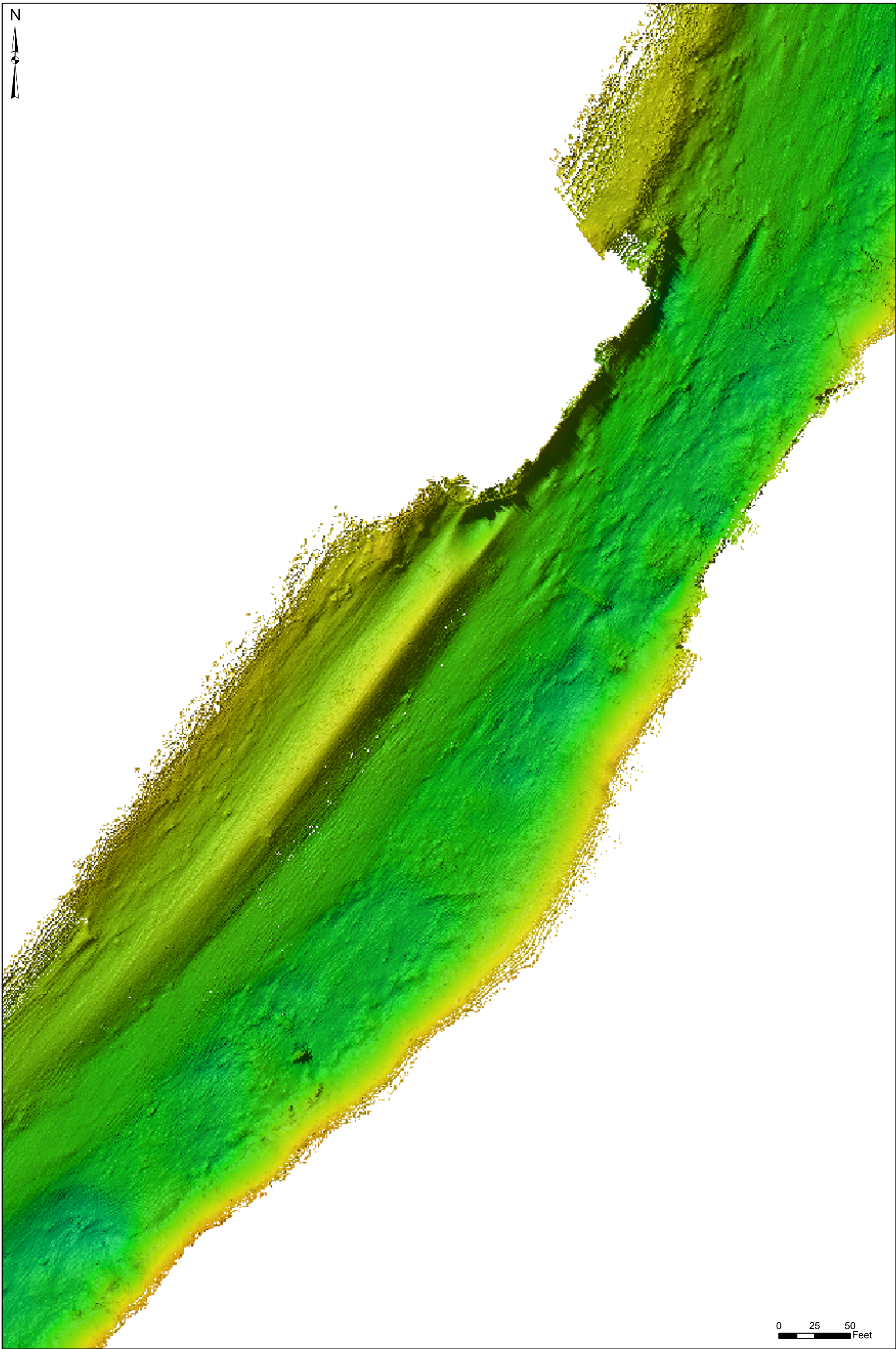


S:\Projects\PASSAIC\MapDocuments\4553001\_CERCLA\Ageed\_2007\MB\_Bathymetry.mxd



**Aspect of the 2007 Mult-Beam Data at RM 8.9**  
*Lower Passaic River Restoration Project*





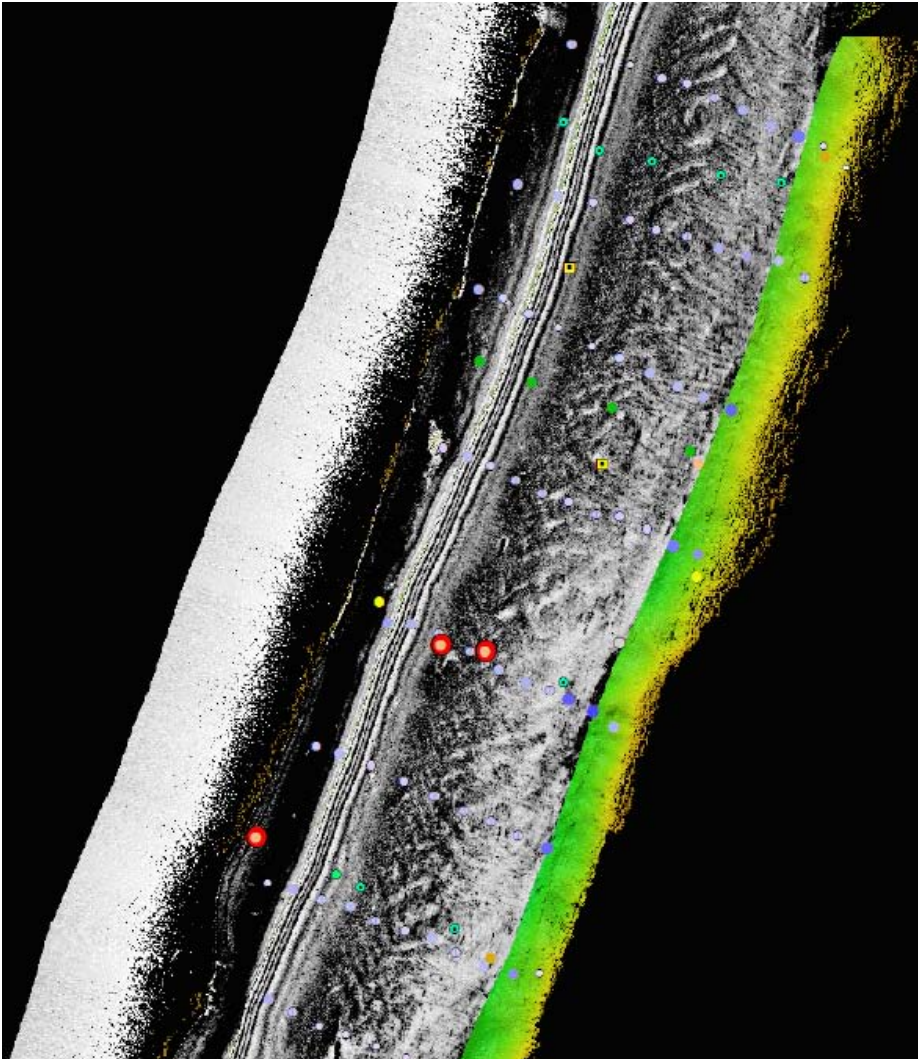
S:\Projects\PASSAIC\MapDocuments\4553001\_CERCLA\Ageed\_2007\MB\_Bathymetry.mxd



**Aspect of the 2007 Mult-Beam Data at RM 11.6**  
*Lower Passaic River Restoration Project*

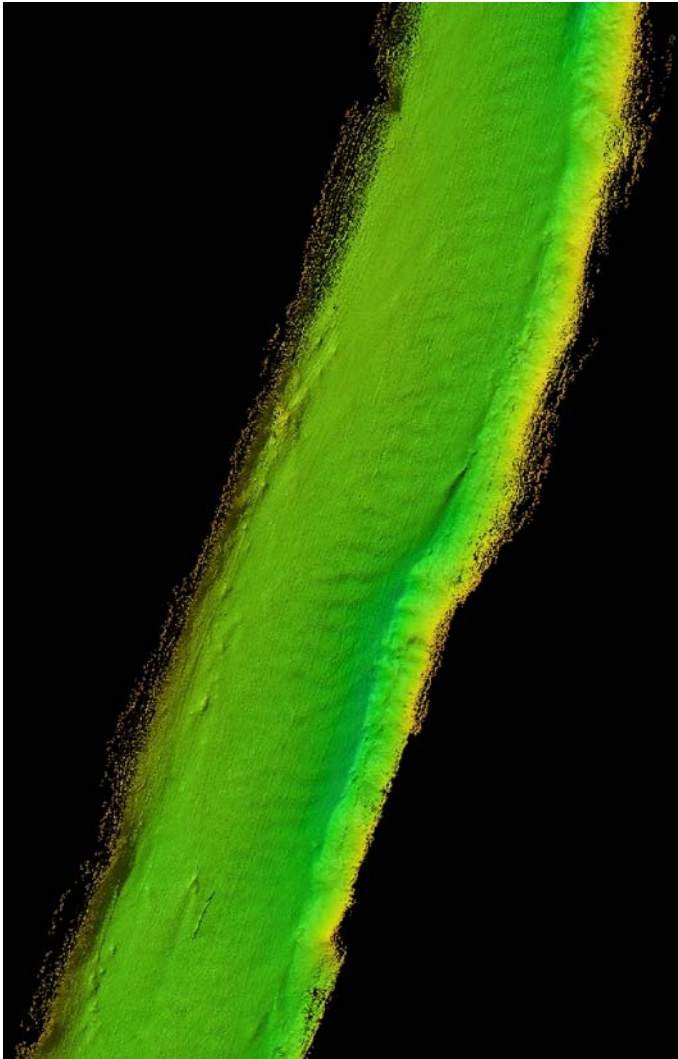


2005 Side Scan SONAR



2007 Multi-Beam Bathymetry Aspect

0 50 100 Feet



2005 Side Scan SONAR and Aspect of 2007 Multi-Beam Data at RM13.45

Lower Passaic River Restoration Project

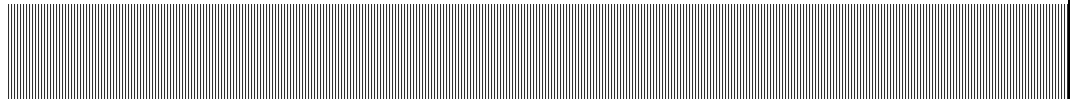
Figure 11-49

2009

Agency Backcheck  
Comprehensive Conceptual Site Model  
Lower Passaic River Restoration Project

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## **Section V**



## Chapter 12 Figures

**There are no figures associated with this chapter.**

